VOLUME 2 NUMBER 10 OCTOBER 1995

OS/2® MAGAZINE

Reviews

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LinkWiz
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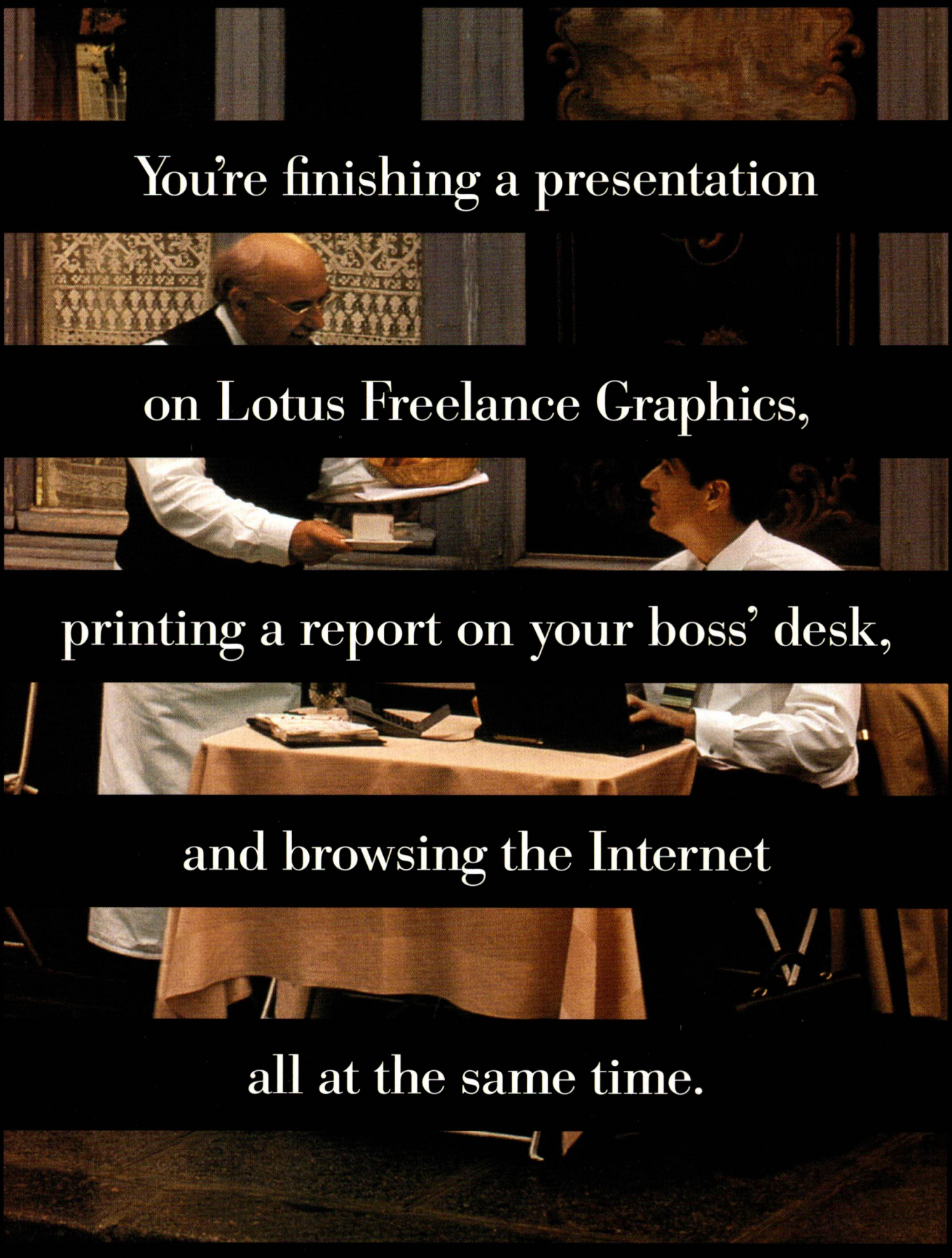
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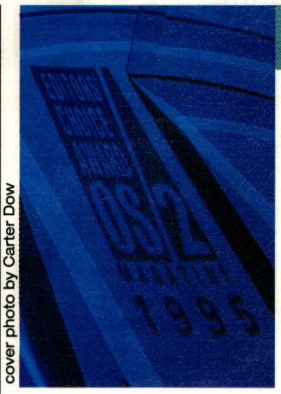

cover photo by Carter Dow

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24 1995 Editors' Choice Awards

In our second-annual awards presentation, the editors of *OS/2 Magazine* are proud to recognize 11 of the most signficant products available for OS/2 users. From shareware to commercial software, from World Wide Web resources to CD-ROMs, it's all here. *By Alexander Antoniades, Guy Wright, and Alan Zeichick*

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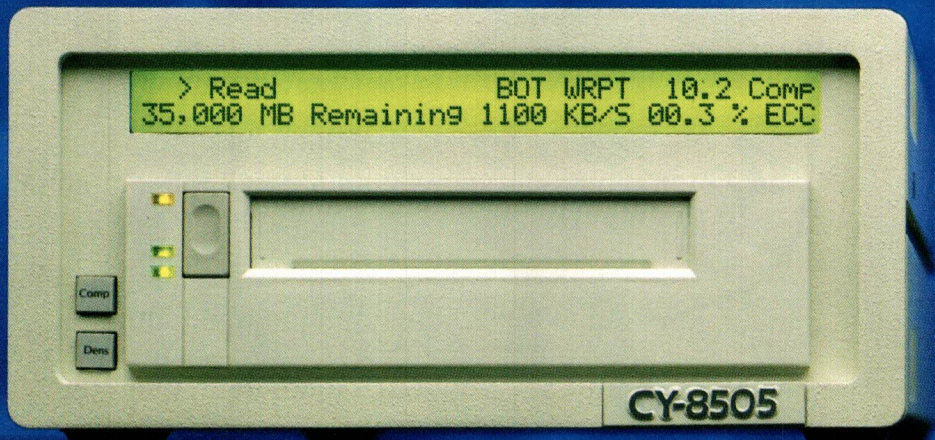

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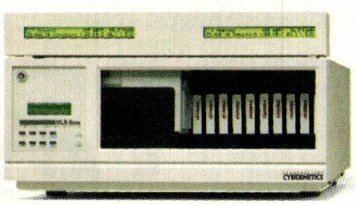

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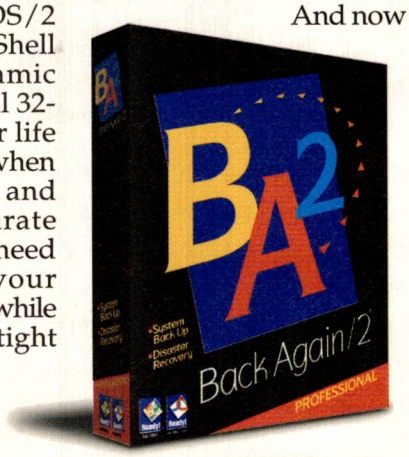

System requirements: IBM OS/2 2.1 or greater, and support for most SCSI tape drives

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Perspectives

Enough Whining!

As you might expect, I spend a lot of time talking to the OS/2 community. I hang out on-line nearly every day, attend technical conferences, focus groups, and OS/2 user group meetings. I also meet with corporate OS/2 users, IBM executives and engineers, and independent software vendors (ISVs).

Regarding the latter group, I rarely write about them in *Perspectives*; after all, *OS/2 Magazine*'s editorial mission is to serve OS/2 users, not vendors. However, I've noticed a disturbing trend. At events like the IBM Technical Interchange and the OS/2 World Conference and Exhibition, in on-line threads, and even in newspaper reports about the OS/2 community, a small but noisy group of ISVs does nothing but whine about IBM.

Sure, there are many things IBM could do better (don't get me started!), but too much of the time, the constant grumbling is self-serving: Many of those so-called "independent" software vendors apparently want IBM to guarantee their financial success. Hey IBM, they wail, do more for *me*.

Not all OS/2 software developers, of course, are constant complainers. Many of the most successful ISVs stick to their knitting, looking for opportunities in the OS/2 market, building and selling new products. They work with IBM whenever possible, thriving on their own otherwise. Unfortunately, the mainstream press prefer to interview the IBM-bashing minority—and this constant grousing by those OS/2 ISVs gives potential new users and new ISVs the wrong idea. So, in this editorial, I'm going to vary from my usual habit, and talk directly to that segment of the ISV community.

Here are some of the most common ISV complaints that I'm personally tired of hearing over and over again:

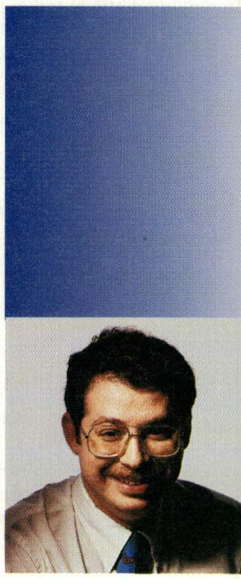
IBM doesn't provide enough developer support. IBM's developer support programs pale next to those of arch-enemy Microsoft. My quarterly IBM Developer Connection CD-ROM is dwarfed by Microsoft's Developer Network multi-CD packs (19 discs in July 1995), support publications, and databases. Microsoft, as an organization, is much more responsive to technical inquiries than IBM's Developer Support Organization. I'm quite sympathetic, since we at *OS/2 Magazine* have similar difficulties getting official news and technical information on a timely basis. We've met this challenge by finding *informal* ways to get the information we need, such as developing contacts within IBM (and most IBMers are very responsive) and networking with OS/2 experts. You can, too.

IBM is destroying ISVs with its BonusPak. Take a look at the OS/2 Warp BonusPak. The ISVs whose products are included in the BonusPak are profiting from the relationship. Their competitors are hurting and crying "foul!" (but not loudly, since they want to be considered for the next BonusPak version). If you were left out of the BonusPak, that's too bad. Now, get back up on that bicycle, and either improve your product enough to make it attractive to buyers, or develop new products to address new needs. Make your fortune by pleasing customers, not by sucking up to IBM's marketeers.

IBM doesn't give us enough money to help sell our products. A couple of years ago, IBM was pretty generous with cooperative (co-op) marketing dollars, which subsidized ISV marketing through IBM-approved channels. Co-op marketing dollars can be quite effective (that's how Packard Bell manages to get its name plastered over nearly every newspaper ad), but IBM shortsightedly decided that its programs didn't make financial sense, and cut them back. So, ISVs, the free ride is over: If you expect to make money selling software in the OS/2 market, you'll need to pay your own expenses.

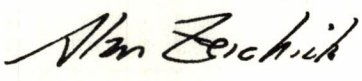
IBM should stop wooing Windows developers. Bold IBM initiatives, such as chairman Lou Gerstner's plan to send key executives to lure big-name Windows developers to OS/2, or the addition of the OS/2 Developer API Extensions, have infuriated a few well-known OS/2 ISVs. Why? When big-name Windows developers enter the market, they'll compete against home-grown OS/2 ISVs. That's unfair, say those ISVs: Exclusive access to the OS/2 market is their reward, their payoff, for unwavering faith in IBM. I have little sympathy. As Windows developers climb on board, more individuals and businesses will choose OS/2 (that's IBM's priority), and OS/2 users will have more software choices (that's my priority).

IBM doesn't do enough OS/2 promotion. Okay, that's true. Did you notice how IBM's OS/2 Warp campaign virtually disappeared after the initial product-launch blitz, and how the OS/2 Warp Connect advertising campaign never got started? (I've never seen an OS/2 Warp Connect TV ad, but I'm told they exist.) Everyone outside of Redmond wishes that IBM would do more to promote and sell OS/2. But if you're an OS/2 software developer, it's your job to market and sell OS/2 tools, solutions, or utilities into the installed base of OS/2 users—independent of IBM's on-again off-again efforts to gain market share from Windows.



Okay, ISVs. We hear you. We sympathize that IBM's not giving you the support you want, either financially or technically. We hear these and other complaints, like how IBM has cut back on its Independent Vendor League program, or it's not helping you get shelf space in stores, or you're not getting beta code and technical specifications early enough, or IBM ignores your bug reports and technical inquiries. Can we move on?

You have a choice. You can look inward, at IBM. Or you can look outward, at opportunities. We're at a historic turning point: Microsoft has raised expectations which Windows 95 won't be able to satisfy. OS/2 is going to pass the 10,000,000-copies-sold mark any day now. OS/2 for the PowerPC is nearly finished. So stop whining about IBM, and get back to work.



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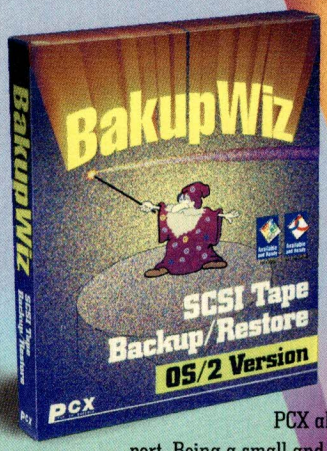

BakupWiz™

OS/2 BakupWiz™ is the SCSI tape backup solution you have been looking for! Designed to exploit OS/2's multiple threading, BakupWiz gives you a quick and reliable method to completely back up your OS/2 system. HPFS and FAT file systems are supported and Extended Attributes, Long File Names, System files, and the Workplace Shell are backed up. You can even restore your entire OS/2 boot volume from tape!

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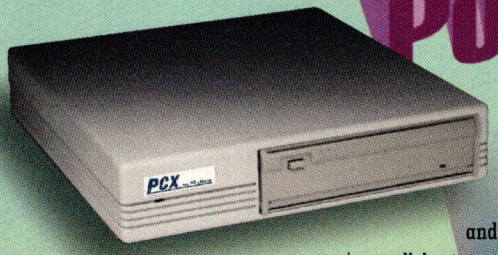

PortaTape™ is your complete portable tape backup solution for OS/2. Using high speed SCSI tape devices, the PortaTape line offers capacities ranging from 250 megabytes to 10 gigabytes. Offering backup speeds from 6 to over 18 megabytes per minute when using a high speed, bidirectional printer port, units in the PortaTape series are priced from $995.

Members of the PortaTape series utilize a range of SCSI tape drives including 1/4 inch, 4mm, and 8 mm mounted in low profile external enclosures. Connection to the host system is via the system's parallel printer port, which may be utilized concurrently with tape drive operation. A copy of OS/2 BakupWiz is included with each PortaTape.

PCX also markets a complete line of standard SCSI tape backup units ranging in capacity from 250mB to over 10gB. Available in both internal and external models, these units are priced from $550. For very large backup needs, PCX offers robotic tape loader mechanisms from 48gB to over 1 terabyte.

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Letters

"Killer app" versus killer OS

Dear Editor:

Will Zachmann's "View from Canopus" (June 1995, p. 15) is, in my opinion, completely off the mark. His contention seems to be that it's the quality of the operating system (OS) that drives application development and that "killer apps" do not spur coat-tail OS purchases.

If it's the quality of the OS that drives application development, OS/2 should be swimming in brand-name applications. It has unquestionably been the better environment (compared to Windows) for years. Even GEOWorks was more clearly thought out than Windows—and we know how far that went. The quality of the OS is not the driving force (for the vast majority) behind its success or lack thereof.

Years ago, I was a true DOS holdout. If it didn't involve a command line, I wasn't interested. A friend demonstrated Microsoft Word for Windows 2.0 and changed all that. I fell in love with Word 2.0 and from then on was slowly dragged more and more into the GUI world. If Word 2.0 had been written for OS/2, I would have become an OS/2 fanatic quite a bit sooner.

But I got sick and tired of Windows' feebleness and the feeling that it was nothing more than a fancy shell. After OS/2 Warp's advertising blitz, I decided I'd had enough of Windows. Yes, I still use a couple of Windows applications, but I now use far more OS/2 shareware to do my work.

I bought Windows because it ran Word 2.0. At that time, Windows was more "visible" than IBM has ever made OS/2. OS/2 needs to quit settling for also-ran status and strike out on its own with mainstream OS/2-specific applications, perhaps from Lotus, Microsoft, Symantec, and so on. It's time for OS/2 to have its own big-name applications. More people might have the same reaction I had years ago when I first saw Word 2.0. Maybe they'll see the latest Word for OS/2 and say, "Hey, OS/2 is for me!"

Mike Hardy

If it's the quality of the OS that drives application development, OS/2 should be swimming in brand-name applications.

Mr. Hardy quite misses my point. It is not some mystical quality of the OS that attracts application development (and I've said nothing of the sort). It is, rather, the business opportunity that any given operating system offers application developers, which is measured, primarily, in terms of the size of the active installed base that the OS has achieved.

The single best thing that IBM can do for OS/2 Warp applications development is to get many more people to use OS/2. One very important way to do that is by providing backward compatibility for DOS and Windows applications. Killer apps do not make operating systems successful. It is the other way around. Successful operating systems attract killer apps.

—Will Zachmann

REXX Cookbook review refuted

Dear Editor:

I am most disappointed in the insulting, highly opinionated, and hit-and-run review Dick Goran gave my book, *The REXX Cookbook*, (August 1995, p. 62). I am convinced that Mr. Goran is not qualified to give any sort of objective opinion about a REXX book. He stridently denies any sort of bias in favor of the works of his friends and associates, which he then praises a little too warmly for credibility.

I would like to address some of his points. *The REXX Cookbook* is not a "hash" and it is certainly not disorganized. It is organized around a group of 40 programs that are anything but trivial. They are useful for many purposes in their own right, notwithstanding the fact that they are the basis of the tutorial. If you are analyzing any group of programs, it is, of course, necessary to reference things in a non-sequential way. Mr. Goran misses this point.

The REXX Cookbook is not a book to be browsed, and yes, the reading is sometimes difficult—because difficult subjects are covered (such as interfacing REXX and DB2/2). It is a tutorial—not a reference book—and requires that the reader's attention start at the beginning and continue to the conclusion of each project. The projects are graduated in difficulty, so opening the book in the middle might be intimidating to some. But, if the reader starts at the beginning, it is not difficult to understand. Each project contains useful code that can not be found anywhere else, collected into modules that can be copied and adapted to other uses.

OS/2 Magazine's readers, not Mr. Goran, should be the judge of the book's quality. I stand behind my work unconditionally. I even offer a money-back guarantee to anyone who buys it directly from the publisher. Call Whitestone Publishing at (505) 268-0678. And, that ain't hash!

Merrill Callaway
callaway@indirect.com

I'm sorry that Mr. Callaway thinks my comments about his book, The REXX Cookbook, and Learn REXX in 21 Days, by Esther and Bill Schindler, were in any way motivated by the Schindlers' association with OS/2 Magazine. That supposition is simply false.

LETTERS, *cont'd on p. 10*

I readily concede that, with what little opportunity my editor-in-chief allows me to editorialize, I tend to be "highly opinionated," as Callaway claims. Which is why I am motivated to include editorial comments in my column. Let me add that I do not generally write book reviews—that being the purview of my fellow contributing editor, Stan Kelly-Bootle. As a matter of fact, the editors specifically directed me to keep my book comments to a single paragraph each. If I had written more about The REXX Cookbook, I think Mr. Callaway would have been even more displeased with me.

I did not refer to The REXX Cookbook as "hash." What I said was that the cookbook only lets you make hash. I was turned off by Callaway's use of typographical elements, such as uppercase versus lowercase and bold versus normal, to identify syntactical elements. This typography makes it very difficult for the reader to follow the flow of the page, because the eye is drawn to the bold elements, particularly if they are also uppercased. His introduction of terms, such as "Pseudo-Code" (meaning comments) and "modular programming" (a meaningless term to newcomers to programming) at the beginning of the book is also awkward.

Informing the reader to install REXX in the middle of text that covered a programming example, instead of in the introduction, is contrary to the style of a cookbook. I would expect the beginning of each example or section to tell the reader what the objectives of the section are, followed by the components and tools that are required or used. The installation of REXX belongs in the introduction. Simulated screen shots as text boxes are also confusing. Captions for the text boxes would have been a simple improvement and actual screen shots would have been even better.

—Dick Goran

For another view of The REXX Cookbook, see the comments of our regular book reviewer, Stan Kelly-Bootle (September 1995, p. 64).

—Alan Zeichick

Say it ain't so!

Dear Editor:

I am an OS/2 zealot, yet I was compelled to commit a sacrilegious act. I recommended Windows 95 to my OS/2 Warp-converted father because he could not get a Sony IDE CD-ROM to work on his IBM ValuePoint. I should add that this CD-ROM was on the OS/2 list of acceptable CD-ROMs. I'm sure that this sort of thing will occur far less frequently with Windows 95. I will continue to use OS/2, but one cannot recommend it to anyone but the most technically inclined if they will be performing incremental upgrades to their system.

Duncan S. Rowe

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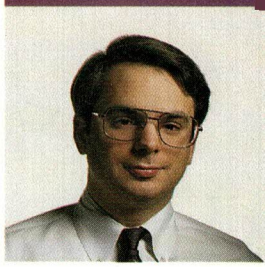
Reader Service No. 26

IBM's New Multimedia strategy

WHAT IT MEANS FOR OS/2.

BY ALEXANDER ANTONIADES



Because OS/2 was designed to be a client/server desktop and server operating system at a time when multimedia on the PC meant barely more than different beep tones, it's not surprising that OS/2 and multimedia have been more similar to oil and water than anything else. As Guy Wright's article, "Multimedia, a Well Kept Secret" (August 1995, p. 26) pointed out, multimedia on OS/2 isn't all that it should be.

IBM has, however, been struggling to make inroads in this exploding consumer arena. Pundits are predicting a larger role for multimedia in business, and IBM has seen the error of its ways and is trying to enter the multimedia fold. Some steps have been taken, but none that are very concrete. Lately, however, IBM, with help from some strategic partners, is trying to make multimedia on OS/2 a success.

The strategy

By breaking multimedia development down into three basic objectives, which include non-programmatic custom development, multimedia title development, and professional programming multimedia development, IBM hopes to offer a comprehensive cross-platform solution that will not only help OS/2, but make IBM more of a player in the multimedia software arena.

The first part of this strategy involves AimTech's IconAuthor multimedia authoring system and a new joint marketing agreement with IBM. IconAuthor, available for Windows and OS/2, is primarily used for making multimedia kiosks and other custom business applications. IBM sales representatives will now sell IconAuthor, and both AimTech and IBM will work towards enhancing IconAuthor with new features, such as Internet access and video support. In addition, the current 16-bit IconAuthor, OS/2 runtime, which is necessary to run IconAuthor files without the main program, will be upgraded to 32-bit code.

The next piece of this strategy involves enhancing the existing tools in IBM's Kaleida technology (see "Dateline: OS/2," April 1995, p. 11). VisualScriptX will be an object-oriented programming environment that uses many of the same paradigms as IBM's Visual Age series of tools, but it will be built on top of the cross-platform Kaleida Media player, so it will work on any of the platforms that the media player does (Macintosh, Windows, and someday OS/2.)

The final piece of this strategy is a series of extensions that will help developers who use IBM's Visual Age series of tools. The current set of multimedia extensions centers on audio and video playback parts, similar to those included with OS/2. New pieces, which are expected to be in beta testing by the time you read this column, include better controls over OS/2's media control interface (MCI) commands, playback capability for IBM's Builder/2 files, and better parts for building touch-screen applications.

The problem

While these three development methods include the necessary cross-platform support for an overall strategy, they don't actually address the issue of multimedia development for OS/2. And, what's worse, they conflict with the few existing OS/2 multimedia development strategies that are already in place.

For example, IBM has already worked with Macromedia to port the runtime of their multimedia authoring program, Director, to OS/2. And, no mention was made of the OS/2 game developer's tool kit. Basically, the only benefit of IBM's multimedia strategy to OS/2 is the fact that the Visual Age enhancements are good, but not radically different from what's out there now. Some of the IBM/AimTech enhancements will be included in Icon Author 6.0 for OS/2, which is due out later on this year. And, VisualScriptX will be a tremendous boon to Kaleida when it happens, but it doesn't mean much for us until the Kaleida Media Player is available for OS/2.

Ultimately, it will be improvements in OS/2 that provide most of the help for multimedia developers. A high-performance system timer that will provide the necessary accuracy for multimedia events and a revamped MIDI subsystem are scheduled to appear in the next version of OS/2 Warp. In addition, a recently signed deal with Human Machine Interface Inc. will allow OS/2 developers to, among other things, play multiple wave files, which MMPM/2 is not currently capable of. Basically, this strategy offers more of a direction for IBM than for OS/2, but it illustrates the problem that IBM has had with plans for the future. IBM must stop constantly overhauling its strategies if they expect anyone to take them seriously.

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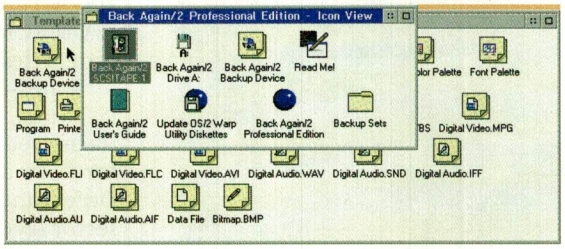
Reader Service No. 1

Late-Breaking Developments in the World of OS/2

Just Announced

Back Again/2 3.1

First ATAPI backup for OS/2



Computer Data Strategies is announcing an update to their OS/2 backup program, Back Again/2. This graphical utility includes a built-in scheduler and supports backup to multiple devices, including DAT drives, floppy disks, network drives, and SyQuest and Bernoulli drives. Version 3.1 supports ATAPI IDE devices, including the new 3080 QIC format tape drives. The Back Again/2 personal edition without SCSI and ATAPI support is available for $49. The professional edition is priced at $149. Contact Computer Data Strategies at (612) 730-4156 or fax (612) 730-4161.

READER SERVICE NO. 151

RhinoCom 1.2

Terminal Software now has BBS capabilities

Rhintek Inc. is releasing an updated version of its terminal program, RhinoCom. This new version offers automated script learning with AutoLogin, global settings, enhanced Host Mode with messaging support, and CompuServe B+ transfer protocol. RhinoCom's Host Mode provides secure BBS functionality that allows unlimited numbers of users who are given the proper access levels the ability to post messages, send mail, upload, download, change drives or directories, or run scripts and macros on the host machine. Sysop-only functions include modifying users' privileges while they are on-line, mail and message system maintenance, local login, and the ability to "chat" with users as they use RhinoCom. You can run multiple copies of RhinoCom for unlimited multi-line support and hook up a Digiboard for 16, 64, or more incoming lines. The list price is $199. Upgrades from previous versions are available free of charge. Contact RhinoCom at (410) 730-2575, fax (410) 730-5960, or e-mail 71333.3443@compuserve.

READER SERVICE NO. 153

DeskMan/2 Productivity Pack

New utility suite

Development Technologies is announcing a new suite of OS/2 programs that are being offered together for a substantial savings. The DeskMan/2 Productivity Pack includes DeskMan/2 1.51b, which provides all of the features of both the corporate and private versions of DeskMan/2 1.51. It also includes Sundial System's Relish 2.12, a limited edition of WarpSpeed Computers' Graham Utilities (offering 15 of the 52 utilities from the full version), Proportional Software's DCF/2 Lite compression utility (which allows only one compressed drive), and a version of Bon Ami's CPU Monitor Plus that monitors CPU, RAM, Disk, and COM-port usage. The DeskMan/2 Productivity Pack has a suggested retail price of $99. Contact Development Technologies at (803) 790-9230, fax (803) 738-0218, or e-mail 71333.3362@compuserve.com.

READER SERVICE NO. 152

ObjectPM Control Pack

PM control library

Secant Technologies Inc. is releasing a C++ library of more than a dozen controls to extend Presentation Manager programs. The ObjectPM Control Pack library contains a cellbox object with multi-column list boxes, a spread sheet with grid control, data field, RTF viewer, calendar, cellcombobox, splitbar control, controlList, and gauge objects. These controls integrate Borland's ObjectWindows and Secant's ObjectPM environments into IBM's OpenClass. These royalty-free controls are available for $99. Contact Secant at (216) 595-3830, fax (216) 292-2546, or e-mail info@secant.com.

READER SERVICE NO. 154

Check+ 2.0

Update to personal finance program

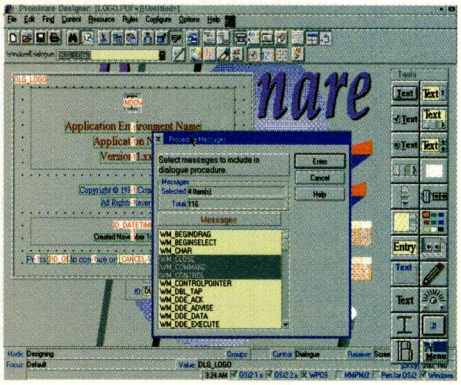
Computer Interface Corp. is announcing an update to their OS/2 financial management software, Check+. This version offers an investment manager for tracking investments, a loan manager for managing liabilities, and a property manager to assist in looking after assets. Other new options include a complex reporting feature that can summarize multiple accounts in the same report. Check+ 2.0 is priced at $89. Upgrades from previous versions are $19. Contact Computer Interface Corp. at (800) 992-3428, (508) 651-8111, fax (508) 651-8112, or e-mail 71151.1526@compuserve.com.

READER SERVICE NO. 155

Just Announced

Prominaire Designer

GUI builder for programmers



ImageSoft is announcing the release of Prominaire Designer, a client/server prototyping and front-end development tool. This utility builds the graphical components of programs with a point-and-click interface that generates C++ code to be integrated into programs. Supported compilers include IBM's C Set++, Borland C++ for OS/2, and Watcom C++ 32, as well as library support for IBM User Interface Class, Borland Object Windows, CA CommonView, and Raleigh Systems ObjectPM. This program supports most of the Presentation Manager interface, including PMCX, MMPM/2, and Pen for OS/2. Prominaire Designer is available for $699. Contact ImageSoft at (516) 767-2233.

READER SERVICE NO. 156

Gear for OS/2

More CD-ROM mastering

Elektroson is now shipping its CD-ROM mastering software Gear for OS/2. This package includes CAM and ASPI SCSI drivers for interfacing to CD-ROM mastering and DAT hardware. Files can be transferred with a drag-and-drop interface to CD-ROM ISO 9660, CD-ROM XA, and CD-DA formatted CD-ROMs, which can be formatted up to ISO level three. Other functions include interleaving, sector level layout, and sector sizing and mastering. Gear for OS/2 retails for $199. A multimedia version is available for $499. Contact Elektroson at (610) 617-0850 or fax (610) 617-0856.

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Reader Service No. 10

CleverManage 1.0

Administer users' desktops

CleverSoft is releasing a new desktop management tool for OS/2. CleverManage allows administrators to control users' access to their OS/2, DOS, and Windows machines while they are using them. With the OS/2-based console program and a TCP/IP or NetBIOS network, this utility can intercept tasks and file activities and act on or log the results. This product is SNMP-compatible and can be controlled from an SNMP console. CleverManage is available for $70 per node and $695 per console. Contact CleverSoft at (207) 883-3550, fax (207) 883-3369, or e-mail 73302.2327@compuserve.com.

READER SERVICE NO. 158

Numerical Assistant Pro 1.0

Scientific calculator for OS/2

Snow Storm Software's scientific OS/2 calculator software, Numerical Assistant Pro, offers multiple radial coordinates, operates in fixed or scientific formats, does financial computations, and has customizable equations. Other features include on-the-fly interface manipulation, screen keys for major functions, direct algebraic editing, cut-and-paste support, and enhanced mathematical error checking. Numerical Assistant Pro retails for $49. Contact Snow Storm Software at (403) 547-0669, fax (403) 547-1018, or e-mail snowstm@ibm.net.

READER SERVICE NO. 159

WipeOut 2.0

Update to classic screen saver

BocaSoft is announcing an update to their OS/2 screen saver for OS/2. WipeOut 2.0 includes support for DeskPic and AfterDark Modules (using Win-OS/2) and monitors full-screen VDM, Win-OS/2, and OS/2 sessions. This release of WipeOut is now integrated with the Workplace Shell, so the program isn't visible from the task list and DPMS support has been added for DPMS-compliant monitors. WipeOut 2.0 sells for $59.95. Upgrades from previous versions are priced at $19.95. Contact BocaSoft at (407) 241-1812, fax (407) 241-6301, or e-mail 71333.3617@compuserve.com.

READER SERVICE NO. 160

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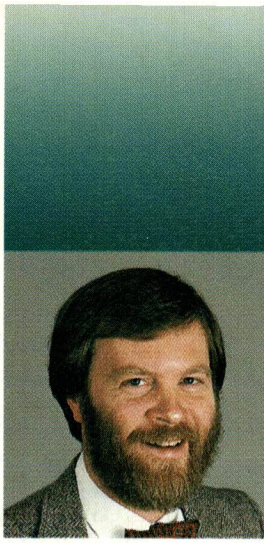

Promises, Promises

THE SHIPPING VERSION OF WINDOWS 95 WILL DETERMINE ITS IMPACT ON THE FUTURE OF OS/2

BY WILL F. ZACHMANN

It is always easy to tell when OS/2 Warp is advancing nicely and when Microsoft's "Windows Everywhere" campaign isn't. The infallible indicator is a sharp up-tick in the volume and shrillness of the cries that "OS/2 is dead!" and "IBM is going to abandon OS/2!" from Windows supporters and surrogates on-line, in the press, and from the rather-die-than-think element of the so-called industry analyst crowd.

Obviously, OS/2 is not dead and IBM certainly is not abandoning OS/2. Overwhelming evidence of OS/2's continued good health and IBM's commitment to making OS/2 Warp successful does little, however, to silence those who apparently believe (or hope) that by repeating their nonsensical claims often and loudly enough, they will somehow talk it to death. They aren't about to let simple facts get in their way.

The latest round of attempts to kill OS/2 by repeated strident assertion very predictably accompanies Microsoft's long heralded (and long delayed) rollout of Windows 95. Similar to Windows NT before it, Windows 95 is much touted as Microsoft's latest and greatest sure-fire cannot-fail OS/2 Warp killer. Incidentally, some people are claiming that it will also kill off the Apple Macintosh and UNIX, but OS/2 Warp is clearly the competing alternative that devout believers in Windows Everywhere most earnestly hope to talk to death.

The fact that they maintain such hope is both a tribute to their undoubtedly accurate assessment that OS/2 Warp continues to pose a very real threat to the inevitability of Windows Everywhere and to their deeply rooted inner anxieties that Windows 95 is likely to be no more effective an assassin of OS/2 than Windows NT was two years ago. Even in Microsoft's best-case scenario, Windows 95 won't kill anything off. In the worst case, Windows 95's true victim just might turn out to be Microsoft itself.

Barring last-minute showstopper problems or further action against Microsoft by the U.S. Department of Justice, Windows 95 should finally be available before you read this column. However, even without having seen the final product, a number of things are quite obvious about Windows 95. Taken together, they add up to considerably less than was originally promised and something far short of fatal for OS/2. On the contrary, Windows 95 might turn out to be one of the best steps Microsoft has taken to promote the success of OS/2 Warp!

The illusion that Windows 95 is some sort of new integrated operating system that is freshly built "from the ground up" that no longer depends on DOS and that provides a true fully-preemptive multithreaded multitasking operating system that is the equal of OS/2 Warp (or, for that matter, Windows NT) no longer has even the slightest basis. The *coup de grace* for that particular collection of claims, which is already shaky, was decisively administered by Andrew Schulman's excellent book, *Unauthorized Windows 95*, which was published earlier this year by IDG Books.

Windows 95 does, in fact, support 32-bit Windows applications and provides a sort of ersatz version of the preemptive multitasking that OS/2 or Windows NT users take for granted. However, because it still rests on the architectural foundations of DOS and Windows 3.1, it continues to suffer from the limitations of that architecture. All Windows applications (Win32 as well as Win16) must serialize on the same critical user interface code by way of the Win16Mutex API call (previously called Win32Lock), making Windows 95's multitasking performance noticeably lumpy and dubiously reliable. Even Microsoft vice president Brad Silverberg, the executive in charge of Windows 95 development, has been quoted as saying that Windows 95 isn't well suited for "mission critical" applications.

Windows 95 also fails miserably to live up to Microsoft's "4MB is our mantra" promises. It simply is not practical for use on a 4MB RAM system, and even on an 8MB system, it appears to be marginal. To obtain optimum performance, most Windows 95 users will probably want at least 16MB RAM. In short, Windows 95's memory requirements will be at least as great, if not somewhat greater, than OS/2 Warp's for equivalent functionality and performance. In addition, Windows 95's disk footprint will be typically as large, if not larger, than OS/2 Warp's.

The promise of great new things from 32-bit Windows applications that are written for Windows 95 will also fall short of fulfillment. Microsoft tossed a fair amount of functionality overboard (at least temporarily) in the rush to put Windows 95 on the shelves to meet the self-imposed August 24 deadline. Simply converting Win16 applications to Win32 applications, as most software vendors have done, provides little practical improvement for users. In fact, it simply adds expense and, in many cases, results in performance no better and sometimes worse than that of 16-bit versions already in use.

Windows 95's new graphical user interface is far from the stunning improvement it has been touted as. For

many Windows users, it will be more of a jarringly unfamiliar and potentially unwelcome change than an obvious improvement. Those who use third-party shells, such as Norton Desktop for Windows, might consider it a major step backwards. Compared to the OS/2 Warp Workplace Shell, the Windows 95 GUI looks like a superficial cosmetic job that is far more limited in functionality and capability. It doesn't come close to the power and customizability that OS/2 has had for years.

All of these factors don't even begin to address the hardware and software compatibility problems that at least some users are sure to face with Windows 95 or the inevitable bugs that Microsoft has allowed to remain in the shipping product in the rush to meet the August deadline. As I write this column, it is not yet possible to determine exactly how big a problem that will be. However, it is beyond question that at least some such problems will occur in all three categories—Microsoft has already admitted as much.

Windows 3.1 certainly has a commanding market share in the installed base and Microsoft has considerable momentum in the marketplace—there's no question about that. To assume, however, that Microsoft's past success with Windows 3.1 automatically assures equal or greater success with Windows 95 is to ignore the high degree of volatility that has long characterized the personal computer software market. WordStar, dBase, and 1-2-3 were all once considered unstoppable juggernauts in their respective product categories. All turned out, however, to be far more vulnerable than anyone had expected them to be when they were at the height of their success.

Windows 95 sets out to do what OS/2 Warp has long done better. It attempts to do so, however, on a dubious foundation. It requires as much memory and other resources (if not somewhat more) than OS/2 Warp, yet it does less, and what it does, it doesn't do as well. Windows and Microsoft do have offsetting positional advantages in the marketplace. Those advantages, however, are not sufficient even to assure that Windows 95 will be as successful as Windows 3.1, let alone for it to kill off OS/2 Warp.

Chances are good that Windows 95 will prove to be a considerably less effective competitor to OS/2 Warp as a shipping product than it has been as vaporware that was promised for future delivery. Sure, some users will buy into the hype and move to Windows 95 without bothering to consider alternatives. Many others, however, will notice that, in fact, OS/2 Warp delivers better on most of the promises made for Windows 95. The result will not be death, but steadily growing market share for OS/2 Warp. Why, it has barely begun to live!

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LINKWIZ 2.1 AND VOICE PILOT 1.0 BY BRIAN PROFFIT

Voice Pilot 1.0

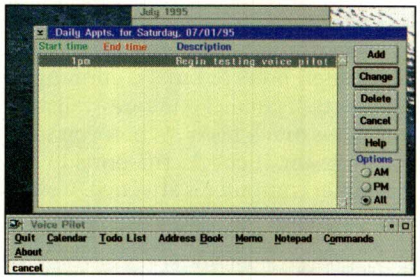
IBM's VoiceType Dictation Systems is a program that not only allows dictation of desktop commands and text, but provides a base upon which voice-aware applications can be written. Voice Pilot Technologies built on that base to create Voice Pilot, an entry-level personal information manager (PIM) that was designed to be run by voice. (This review assumes some passing familiarity with VoiceType, which was reviewed in July 1995, p. 42.)

The focus is on voice input

After copying the Voice Pilot files onto your disk and creating the icon (no installation program exists), you still have work to do before starting to use the program. Be prepared to take another 15 to 20 minutes to enter and dictate new commands that are needed into IBM's VoiceType. It's not a big deal, but it is a firm reminder that the voice recognition in Voice Pilot can be no better than the underlying VoiceType technology, so if you haven't spent time tailoring VoiceType to your voice patterns and correcting false recognitions, Voice Pilot won't work well.

Read the VoiceType manual and make sure you follow the instructions on making voice corrections so the system's model of your voice is as accurate as possible. I recommend that you work with VoiceType for a few days to get all of the personalization problems taken care of before starting Voice Pilot. You might otherwise be frustrated and blame Voice Pilot for problems in the underlying speech recognition system.

Strangely enough, you must end VoiceType before running Voice Pilot. It is a great frustration that you must decide between voice control of your



system and use of the Voice Pilot PIM—you cannot run VoiceType while using Voice Pilot.

The program is totally voice-driven, but it is often more convenient to use the keyboard. (Of course, at other times, the keyboard doesn't work.) It can become tiring to try to remember when you have to give the command to turn off the microphone, just to indicate that you're through with one field, and give the command to reactivate the microphone to move to another field. And, in some fields, such as the subject line of memos, you must inexplicably speak a single letter at a time, instead of being able to use normal dictation.

...Not a personal information manager

The program comprises a calendar, to-do list, address book, memo-creation tool, and notepad. Virtually none of these features is as full in function as most commercially available products, or even most shareware, starting with the calendar. You navigate through the days and enter appointments vocally, but the functions are limited. For example, no support exists for such common features as recurring appointments or alarms. No integration with the address book is provided to indicate who appointments might be with. You can't even print your appointments. And, window sizes and display formats are not changeable.

The calendar supports blocking days off as holidays, but isn't aware of any on its own. You'll have to indicate that days, such as Christmas, are holidays. Also, no support for archiving appointments is included.

The to-do tracking module lets you enter reminders and set three different priority levels. To-do items cannot be printed and no facility exists for moving uncompleted items forward to the next day. They aren't integrated with the address book or calendar at all.

The address-book module is up-to-date in that it allows for mobile and beeper numbers in addition to business, fax, and home lines. A limited information area is featured, but no real means for tracking contacts with people is included.

The memo module allows you to create memos that can be printed and/or filed. You can choose a person fromthe address book and insert their name into the To field—the only real integration anywhere in Voice Pilot. No mail-merge function allows you to send the same memo to multiple people in the address book. It includes no support for OS/2 fonts and doesn't even respect some of the special formatting commands that are built into the underlying VoiceType, such as allowing capital letters other than at the beginning of a sentence. Since you don't dictate into VoiceType, you can't update the voice recognition model to improve performance and to provide easy editing functions.

The notepad is simply a dictation window without print, copy and paste, and other functionas that would sim-

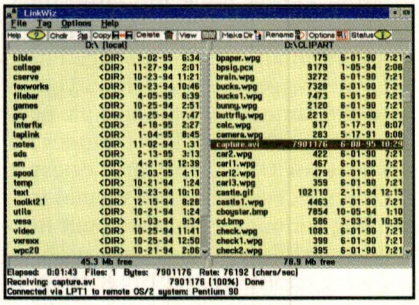
plify use of the information that is dictated. And, once a notepad (or memo) has been saved, it cannot be edited with voice commands. In fact, you are often unable to manipulate the text with the keyboard!

Glee or flee

When Henry Ford rolled out his first automobile prototype, I'm sure plenty of people pointed out to him that a horse was faster, less expensive, easier to operate, and even (surprisingly) smelled better. That didn't prevent the automobile from taking over in the long run. We are actually somewhat past that point in the development of voice technology for computers. IBM's VoiceType is a surprisingly good dictation system. Voice Pilot, however, is clearly a first-generation application that was built on that technology.

At this point, the market is full of personal information managers with much more functions that are easier to use than Voice Pilot (look at the free IBM Works in the OS/2 Warp BonusPak). And, when you add the $149.95 for Voice Pilot to at least $500 for the VoiceType software and hardware, you're paying a high price for what is still only a novelty. Physically challenged users might find that Voice Pilot in its current form is just what they need. But, the rest of us can wait until Voice Pilot Technologies turns this program into a complete PIM before getting too excited. It's a peek at the future, but still just a prototype.

LinkWiz 2.1



When Traveling Software first introduced LapLink, a pioneering file-transfer utility, the portable computer market was still somewhat small. Since then, the notebook market has exploded—not to mention the use of OS/2. OS/2 users have had restricted options for data transfer until now. But thankfully, the options just took a large (and extremely fast) step forward.

Fast startup

Installing LinkWiz requires just a few quick keystrokes followed by a few more seconds of data transfer. You can even instruct LinkWiz to install itself onto a remote machine if both are running DOS and are connected through the serial (not parallel) cables.

Starting to use LinkWiz is just as easy. Connect the two computers between which you will be transferring files, using the provided cables. You can connect through the computers' parallel (printer) ports or serial communication ports. If parallel ports are available, transfer is much faster. When you start the program, it checks the ports to see if another computer is attached. If so, it connects automatically.

As soon as connection is made, a file list from the remote machine appears on the right side of the LinkWiz window. You can scan through directories and files on either system in this window. If you mark a file and click on copy, the file is transferred into the displayed directory of the other system.

DOS-based interface

Some aspects of the interface, however, betray the non-OS/2 heritage of the program. For example, to mark a file, you must double-click on it. Single-clicking doesn't mark (contrary to the documentation), and using <Ctrl>, <Alt>, or <Shift> keys doesn't work to mark multiple files either.

On the other hand, the ability to make wild-card tags is a nice option. If you want to copy all text files from a directory, it is handy to be able to specify **.txt* to mark all of those files automatically. You can also send files with drag-and-drop. Dropping files onto LinkWiz (if the program is already running) transfers them to the remote computer. And, you can drag multiple files, just as you would with any OS/2 program. The documentation says that you must drag files with the middle mouse button. Fortunately, that instruction is wrong—you use the right mouse button, just as you would for all drag operations.

Unfortunately, the file is not necessarily transferred to the directory that shows in the LinkWiz window! Files are transferred using the full path from which they were dragged. In other words, if you drag *\os2\apps\epm.exe* and drop it onto LinkWiz, it doesn't matter which directory LinkWiz is displaying for the remote system; the file will be copied into *\os2\apps* of the current drive on the remote system—even if those directories must be created to do so.

The View entry on the button bar is designed to allow you to browse a file's contents before deciding whether to copy it. That is a great idea, but it simply produces the message: "View file not currently implemented for OS/2." So, why is the button there? Come on, folks. You don't have to reinvent the wheel. If you create the button before you write your own browser, why not at least make a simple call to the OS/2 System Editor? Many of us already have browse utilities. Why not let us specify the path to those and link them to the View button? It would be better than a button that doesn't work.

LinkWiz isn't good at multitasking. During a long transfer, I tried to change directories and queue up other copies. The two systems promptly dropped the connection. After watching them churn for 60 seconds, trying to regain the connection, I ended LinkWiz on one machine and brought it back up. They regained their connection, but I could not easily determine where the transfer had stopped. I support the objective of speedy data transfer by monopolizing the system, but LinkWiz needs to be more graceful if the user insists on trying other things during a transfer.

By the way, restarting LinkWiz showed that the changes I had made in the window size had not been stored. It opened in the default size. Even if you click on Save Options, your preferred window size is not saved. I wish PCX wouldn't assume that they know the size of the window that I want to use.

Other interface anomalies

No matter how many files you have marked, if you click on Delete, the program only deletes the single file that is currently under the highlight (whether marked or not). What is even more confusing is that the directory displays on the local and remote computers aren't connected. In other words, the

local system might think that *\os2* is the current directory on the remote, while the remote might consider *\temp* to be its current directory.

What's even worse is having the directory lists scroll by themselves. It is common to scroll the two list boxes so that you are looking at approximately the same place on both computers. You might want to visually compare the sizes and dates of files with the same name. LinkWiz makes that task difficult. As soon as you select a file from one side of the window, the other list box moves itself back to the top of the list. You must manually re-scroll the lists constantly.

Speaking of those listboxes, I'd like to see other drives added to the top of the list to make it easier to change drives without taking your hand off the mouse. As it is, you have to click on the directory information at the top of the list and type in the new path.

The on-line help isn't quite synchronized with the program. It seems that many options were added to the program after the help was considered complete. Those items don't show up in the help panels. Cloning disks, for example, doesn't appear in the on-line documentation at all.

Did you say cloning?

LinkWiz is able to copy hidden and system files and even a drive's boot record, allowing complete cloning of one drive onto another. A surprising limitation is that the two systems must be of the same architecture—you cannot clone a drive from a microchannel system onto a drive in an ISA system. Also, if you want to clone an HPFS drive, the target system must have been booted from the OS/2 installation disks, the target drive must be freshly formatted, and the batch version of LinkWiz must be running on the target. To clone a FAT drive, the target cannot be running OS/2, it must be running DOS from a DOS boot disk.

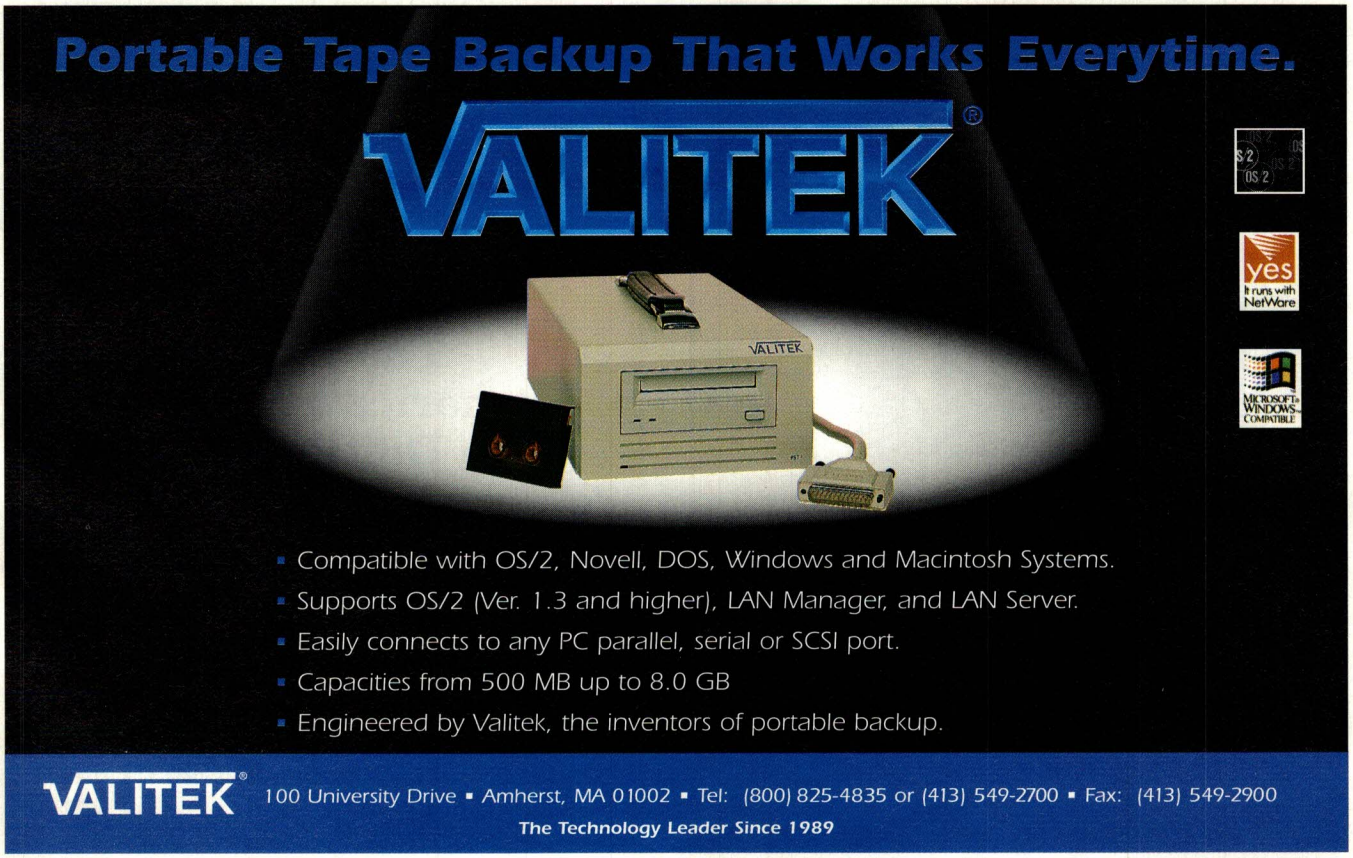
An interesting addition is the ability to copy the entire contents of a drive into a single "dump" file on the target drive. That ability simplifies the use of compression tools, such as ZIP, to archive the drive contents.

On the other hand

The underlying requirement for a data-transfer program is transfer speed, which is where LinkWiz shines. This program flies! It appears to be many times faster than LinkRite and a stopwatch proves that. Copying large files is quicker than copying small files, as less time is spent going through the directory. But, even copying small files, I consistently registered speeds of more than 70,000 characters per second (cps). To put that into perspective, imagine that your 14,400 bits per second (bps) modem could suddenly run at over 700,000 bps! I have never come close to that with LinkRite.

DOS, Windows, and OS/2 versions are all on the same disk. I was able to transfer files back and forth between DOS and OS/2 systems (with long HPFS file names automatically truncated) as well as between computers that were running the same operating system.

A UNIX/Xenix version is also available. In fact, LinkWiz includes the ability to convert files between OS/2 and UNIX file formats. OS/2 and DOS have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both a carriage return and a line feed character to mark the end of each line, while UNIX uses only the line feed. UNIX doesn't recognize the <Ctrl+Z> character that OS/2 and DOS use to indicate the end of a text file. Telling LinkWiz to make these translations is actually a very dangerous option, however, because binary files might inadvertently have the representation of these characters embedded in their data. If you activate this conversion, LinkWiz can accidentally destroy data by incorrectly converting binary files.

A batch version of LinkWiz is included that allows you to call it from a command prompt, specifying files to be sent and/or received to have the transfer take place automatically. Unfortunately, you can use wild cards to send a large group of files, but you cannot use wild cards to receive a group of files.

A synchronization option causes the selected directories on both systems to be examined, allowing files to be sent back and forth as needed so that both systems have the most current version of each file.

Glee or flee

Don't let the 2.1 version number fool you. This program has been around for a while on other platforms, but it is new to OS/2. The number of anomalies in the interface proves that point. But the program has two strong qualities working for it. First, it is now the property of PCX. Through the history of BakupWiz, PCX has shown itself to be a company that is responsive to the requests and needs of customers. Second, it has a blindingly fast communications engine. If stability and usability are your prime concerns, LinkRite is still the best OS/2 product. If you can overlook some of those benefits for speed, LinkWiz is a better option. The competition should incite both companies to create even better versions in the future.

RESOURCES:

Voice Pilot 1.0 ($149.95)
Voice Pilot Technologies Inc.
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Miami, FL 33156
(305) 670-0807
Fax: (305) 670-8009
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LinkWiz 2.1 ($149)
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CompuServe: OS2BVEND section 2, 70216,174
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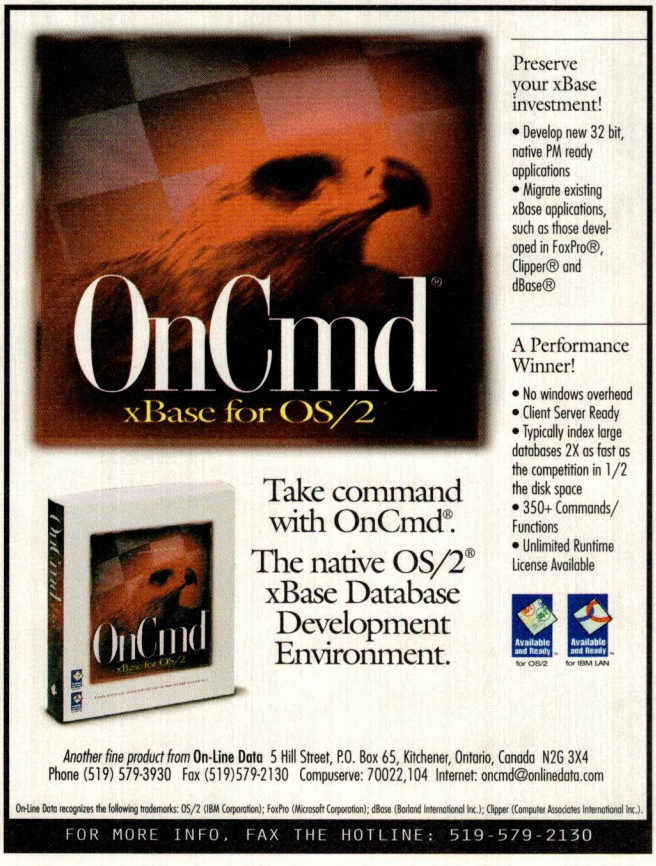
Brian Proffit was part of IBM's OS/2 team and left IBM to become the director of PC Week's Corporate Labs. He is now the president of Visionary Research, senior contributing editor for OS/2 Magazine, and solutions advisor to PC Magazine. He can be reached at Internet 75300.1466@compuserve.com.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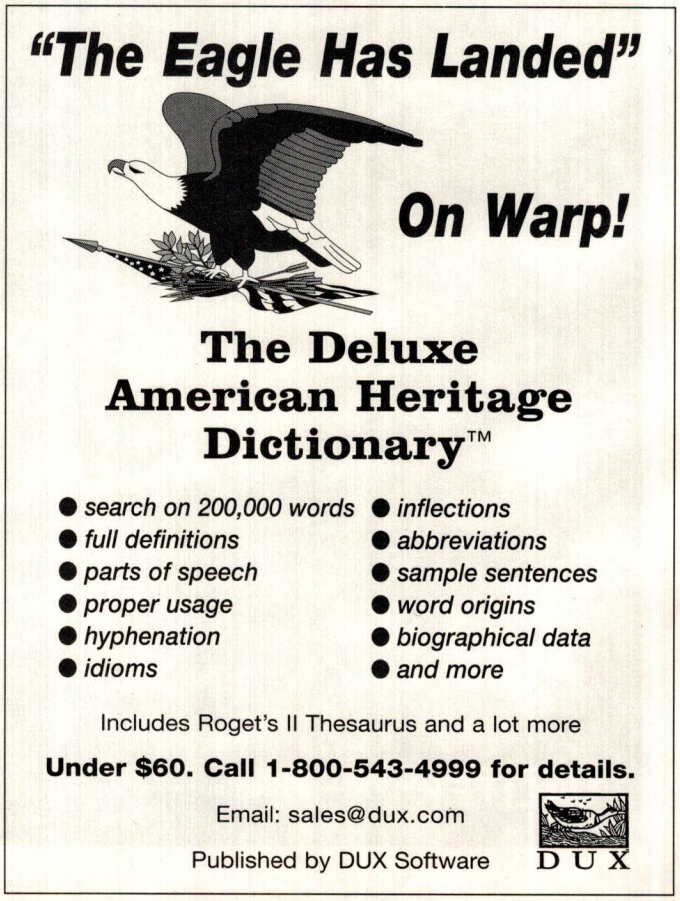

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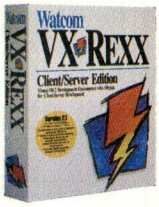

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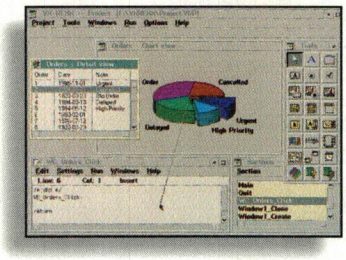

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Ready! for OS/2 — Available and Ready for IBM LAN — PC Magazine Editors' Choice, February 8, 1994, Watcom VX-REXX, Version 1 — "The best new development tool of 1993" — Software Development Productivity Award 1993 — Editors' Choice Award OS/2 Magazine 1994 — Watcom VX•REXX V2.0

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EDITORS' CHOICE AWARD OS/2 MAGAZINE 1995

Pick of the Crop

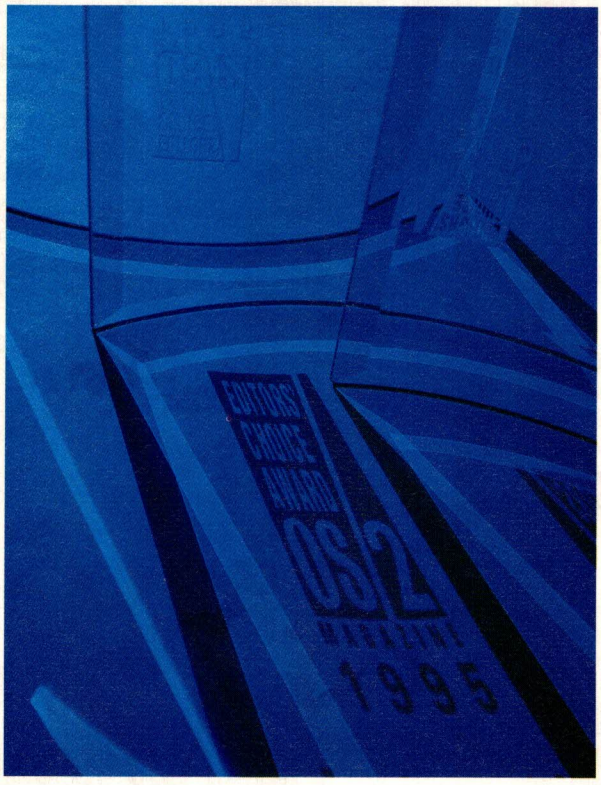
The 1995 *OS/2 Magazine* Editors' Choice Award Winners.

There are many flavors of magazine editorial awards. Some publications give awards to products based on reader surveys, either bound into the magazine or through random polling. Other magazines give their seal of approval to products that win competitive shoot-outs or meet certain fixed price and performance criteria.

Here at *OS/2 Magazine*, we prefer a less formal approach that more closely fits the dynamics of the OS/2 community. The 11 products recognized here, like the 16 we spotlighted last year ("The Editors' Choice," October 1994, p. 32), were selected by the editors of the magazine, with consultation from a group of regular contributors, columnists, and trusted experts.

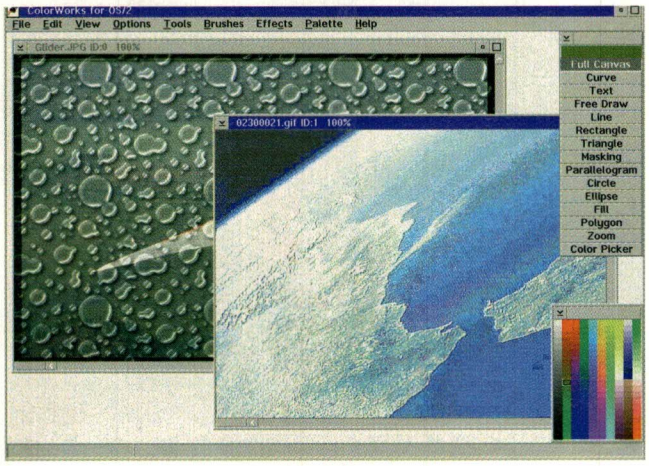
What makes an Editors' Choice winner? We're looking for products or services that are appropriate for use by a majority of our readers and are, in fact, in wide use. Users of these products or services must be enthusiastic about them, recommending them to peers at user-group meetings, or touting their benefits online as shining examples of the best available for OS/2. A common thread: These products offer much more functionality than you'd expect, with extra utilities, add-on modules, and options galore. We like to say that they're sworn *by*, rather than sworn *at*.

There's more to a winner than *that*, of course. The products we've recognized must also have passed personal muster by the editorial staff or our closest advisors. Many of these products have been formally reviewed in *OS/2 Magazine* (we'll give you pointers to the reviews), but all have been used extensively by the magazine team. However, unlike those magazines that base their reviews on write-in polls, we haven't run a popularity contest.



The cut-off for choosing winners was June 1, 1995; products released after that time weren't considered for this year's award program, and awards are given for the current version as of that date. The awards themselves were publicly presented on July 18th at the OS/2 World Conference and Exhibition in Boston, Mass.

One change from last year: You'll notice that no books were chosen as 1995 Editors' Choice Award winners. We felt that, because so many of our regular writers and contributing editors are book authors themselves or serve as technical reviewers for the major book publishers, giving awards to OS/2 books constitutes a potential conflict of interest. And now, without further ado, the envelope please...



ColorWorks 1.0

SPG, Inc.

ColorWorks is a new player on the OS/2 software scene—it's unusual for software to win an award in its very first incarnation. What sets ColorWorks apart is that it's truly a professional-level tool—in this case, for image and photo manipulation. To make the obvious comparison, it's the Adobe Photoshop for OS/2—but with even more bells and whistles on top of its integration into the OS/2 desktop.

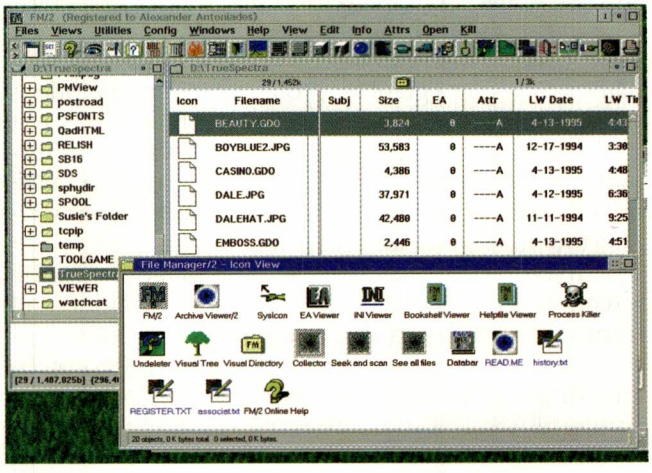
What impressed us most about ColorWorks is the philosophy that "if one setting's good, a dozen's even better." Literally hundreds of settings for filters and special effects are available, and you can write your own if you don't find exactly what you're looking for. You can combine filters and effects to apply them simultaneously; if the results aren't what you want, that's what the dozens of levels of undo and redo are for. To speed things along, ColorWorks is designed to take full advantage of OS/2 for Symmetric Multiprocessing (SMP), including fine tuning for individual threads. When speed's not a priority, ColorWorks will run in a minimal OS/2 system. (ColorWorks was reviewed in September 1995, p. 45.)

File Manager/2 2.32

Barebones Software

When it comes to manipulating files and directories, OS/2's Workplace Shell doesn't make it easy. Sure, you can open up a drive object and move things around, but it's needlessly difficult to perform complex tasks. We need a file manager! And thus enters File Manager/2 (FM/2). Like all file managers, it handles the basics of copying, moving, and deleting files, but FM/2 goes beyond the norm by supporting and extending the Workplace Shell's object-oriented paradigm. Want to rename a file? Click on the name, and retype it. Right-click on WPS object to choose the appropriate action, or use drag-and-drop.

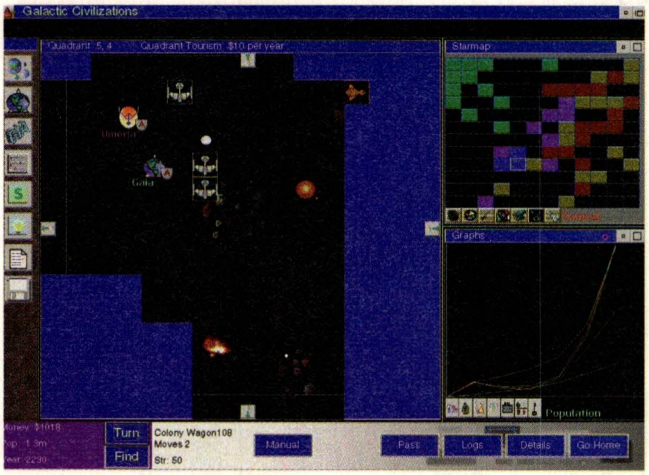
FM/2 includes the ability to work with popular PC archives (such as ZIP or ZOO), treating them intuitively as though they were subdirectories. Additional FM/2 utilities defragment HPFS and FAT partitions, edit *.ini* files, view *.inf* books, set task priorities, quick-format floppies, and lots more. FM/2 and its add-in utilities are shareware, so you can try before you buy.

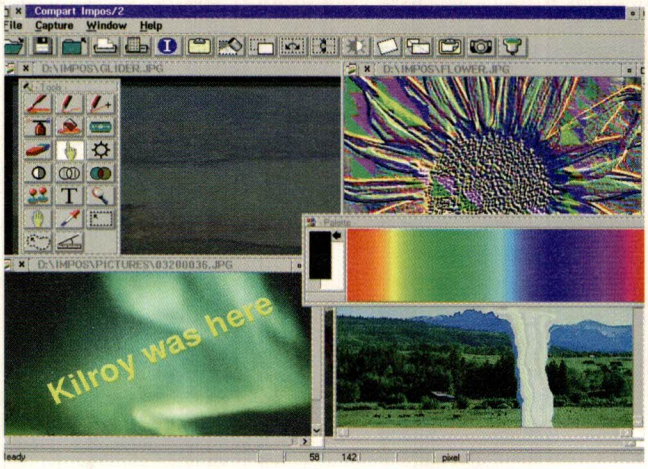


Last Year's Winners

We found it surprising that so many of last year's 16 *OS/2 Magazine* Editors' Choice Award winners are essentially unchanged; 12 months later, most haven't been upgraded or tweaked to work better (or at all!) with OS/2 Warp 3.0. The only repeat winner is the DeScribe word processor, which evolved from a $495 version 4.0 into a $50 version 5.0. The 1994 winners were:

4OS2 2.0 and 4DOS 5.0 (JP Software Inc.)
C Set++ 2.1 (IBM Corp.)
cc:Mail for OS/2 WPS 1.01 (Lotus Development Corp.)
Client/Server Survival Guide by Harkey & Orfali (Van Nostrand Reinhold)
DeScribe 4.0 (DeScribe Inc.)
DeskMan/2 1.5 (Development Technologies Inc.)
FaxWorks 1.3 for OS/2 (SofNet Inc.)
Footprint Works 1.0 (Footprint Software Inc.)
Gamma Tech Utilities 2.1 (SofTouch Systems Inc.)
Golden CommPass 2.11 (Creative Systems Programming Corp.)
Hobbes CD-ROM, August 1994 (Walnut Creek CDROM)
OS/2 Unleashed, 2nd Edition by David Moskowitz, David Kerr, et al. (Sams Publishing)
Relish 2.12 (Sundial Systems Corp.)
REXX Reference Summary Handbook, 2nd Edition by Dick Goran (CFS Nevada Inc.)
SkyScraper 1.0 (Binar Graphics Inc.)
VX-REXX 2.0 (Watcom International)





Galactic Civilizations 1.05

StarDock Systems, Inc.

Despite IBM's claimed interest in supporting games and multimedia under OS/2, native OS/2 games are few and far between, and most are far less sophisticated than Windows and Macintosh best-sellers. The first exception is Galactic Civilizations (GalCiv), which is the first OS/2 game with content and execution likely to satisfy a computer gamer.

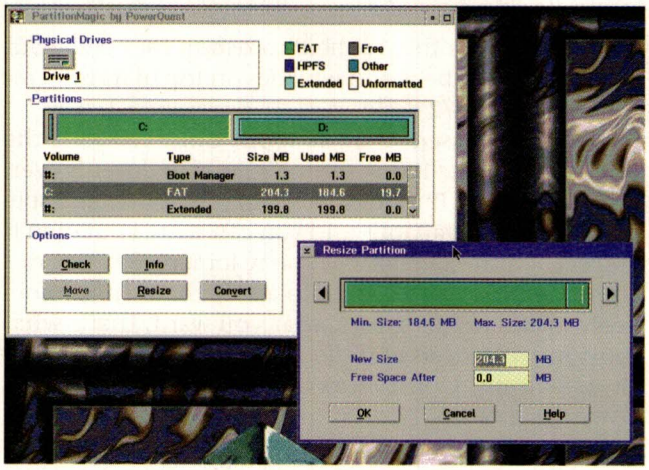
GalCiv's role-playing theme of galactic exploration and conquest is well-imagined, captivating, and internally consistent. The depth of play is good: Even small decisions can affect the game's play later. Good use of sound and animation, powerful use of threading to speed up game play, and good use of multiple windows for controlling different aspects of the game are provided. GalCiv also automatically scales color and resolution depths to match your OS/2 system configuration—why don't more games offer this ability? If more OS/2 games like GalCiv were available, then OS/2 would truly be a multimedia platform. (Galactic Civilizations was reviewed in June 1995, p. 28.)

Impos/2 1.2

Compart Systemhaus GmbH

There's image manipulation and there's image manipulation. If you're a graphics professional, ColorWorks is the tool you need for sophisticated graphics effects. But if you need to process images in a wide variety of formats or from a number of different sources, and make minor editing changes to them, Impos/2 is an affordable tool that won't let you down.

With Impos/2, you can capture images from the screen, from the OS/2 clipboard, from a scanner, and from video overlay cards. It supports a wide variety of graphics formats, such as TIFF, GIF, JPEG, PhotoCD, and Targa, and you can easily view multiple images concurrently. It also handles many color and black-and-white hand and flat-bed scanners. You can use Impos/2 to convert between these formats, crop, trim, and more with ease—especially because it's fully integrated into the Workplace Shell, including drag-and-drop support. (Impos/2 was reviewed in August 1995, p. 55.)



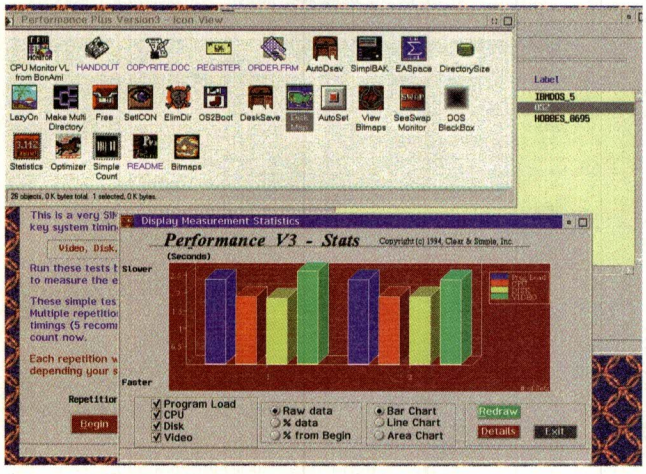
PartitionMagic 1.0

PowerQuest Corp.

Who would have thought that more than a decade after the IBM PC/XT was introduced, we'd still be using FDISK to create and destroy disk partitions? And that the only way to alter a partition was to back up it up, delete it, recreate it, format it, and hope that the tape restores properly?

The biggest surprise with PartitionMagic, a utility that eliminates much of those headaches, is not that it works—but that nobody developed it sooner. PartitionMagic's functions are easy to explain: It makes partitions bigger. It makes them smaller. It converts them from FAT to the more efficient HPFS format. It moves partitions around on the disk. The best part is,

you don't have to backup and restore your data (although we still recommend it—after all, why tempt fate?). Even better, PartitionMagic keeps track of OS/2's Extended Attributes (EAs), which are often lost if you manipulate the hard disk with DOS-based tools. We're not sure if PartitionMagic is cost-effective as an end-user tool, but it's a must for technical support professionals and power users. (PartitionMagic was reviewed in July 1995, p. 17.)



Performance Plus 3.0

Clear & Simple

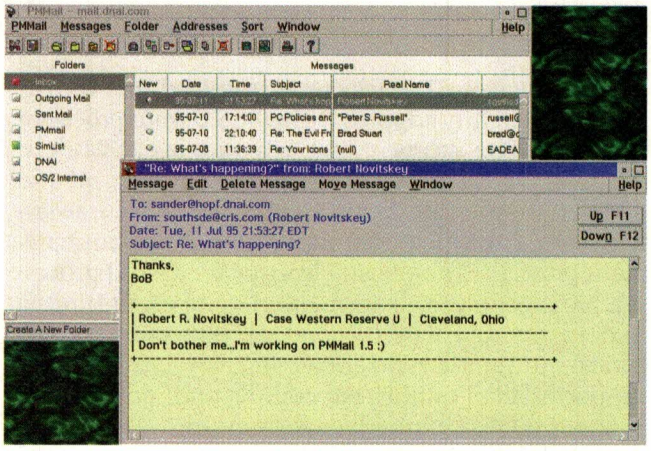
It almost sounds like a radio jingle: "Teaches as you tune!" But that's what Performance Plus does: It automatically fine-tunes many of OS/2 Warp's internal settings to provide the best performance on your hardware, while teaching end-users about how a 32-bit operating system works.

Performance Plus's heart is the Optimizer, which analyzes an OS/2 system and recommends *config.sys* parameters based on the installed hardware, operating system version, and available resources. Similarly, Performance Plus can figure the best settings for most DOS and Windows applications. Other functions include making OS/2 emergency boot disks, viewing performance statistics, monitoring swap-file growth, and saving the OS/2 desktop. The education is provided in the program's manual—which is as good as many OS/2 books—and easy-to-understand prompts and dialogs that explain the various OS/2 settings, not just presenting them with cryptic names to baffle the end-user.

PMMAIL 1.1

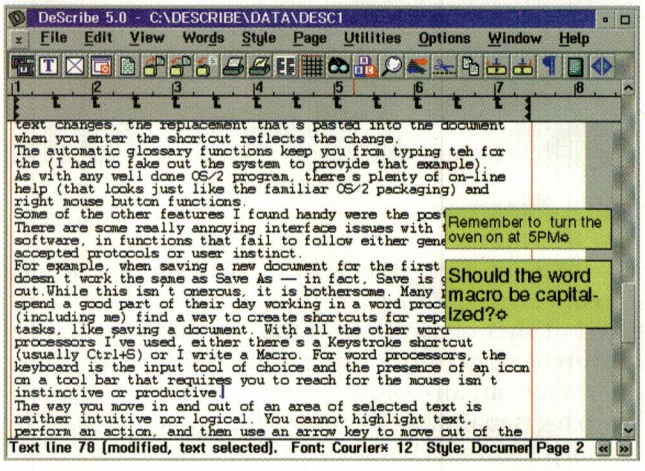
SouthSide Software

OS/2 users are an independent lot; they rarely agree on anything. One exception: Most will agree that including the Internet Access Kit in OS/2 Warp 3.0 was a great


PMMail - mail.dnai.com
PMMail Messages Folder Addresses Sort Window Help
Folders
Messages
New Date Time Subject Real Name
Outgoing Mail
Sent Mail
PMmail
SimList
DNAI
OS/2 Internet
95-07-10 17:14:00 PC Policies and "Peter S. Russell"
95-07-10 22:10:40 Re: The Evil Fr Brad Stuart
95-07-08 11:36:39 Re: Your Icons (null)
"Re: What's happening?" from: Robert Novitskey
Message Edit Delete Message Move Message Window Help
To: sander@hopf.dnai.com
From: southsde@cris.com (Robert Novitskey)
Date: Tue, 11 Jul 95 21:53:27 EDT
Subject: Re: What's happening?
Up F11
Down F12
Thanks,
BoB
Create A New Folder
Robert R. Novitskey | Case Western Reserve U | Cleveland, Ohio
Don't bother me...I'm working on PMMail 1.5 :)

idea—and that the IAK's e-mail package, UltiMail/2, is bloated, slow, and painful to use.

Many OS/2 users agree that PMMail, on the other hand, is exactly what should have been included with the IAK. It's simple. It's blazingly fast. It takes up a tiny amount of disk space. There's built-in uuencoding and decoding. With the registered version, incoming mail can be refreshed at regular intervals. The user interface is clean, and designed with multitasking in mind. The only thing that PMMAIL and UltiMail/2 have in common, unfortunately, is a dearth of documentation. Despite this one major shortcoming, PMMAIL is a fine example of an independent software vendor—in this case, a shareware author—jumping in to remedy an obvious flaw in IBM's OS/2 Warp software.

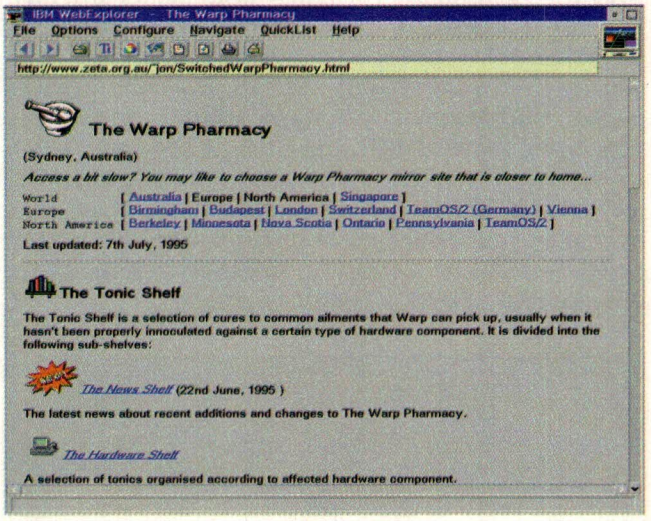

DeScribe 5.0 - C:\DESCRIBE\DATA\DESC1
File Edit View Words Style Page Utilities Options Window Help
Remember to turn the oven on at 5PM
Should the word macro be capitalized?
Text line 78 [modified, text selected]. Font: Courier 12 Style: Documer Page 2

Voyager CD

DeScribe Inc.

Our only repeat winner, the DeScribe word processor has evolved considerably in the past year. The new version 5.0 improved performance and added new functions demanded by many users—footnotes and an equation editor in particular.

The Voyager CD package, introduced this spring, includes a slightly crippled DeScribe 5.0 word processor (network drive access is disabled) on one CD-ROM. It supports OS/2 2.11, OS/2 Warp, and both 16-bit and 32-bit Windows, all for less than $50—offering access to a mature, fully featured application at bargain-basement price. It's an unbeatable value for a word processor. Voyager has easy-to-make envelopes, unlimited undo, a plethora of pretty good text import and export filters, automatic typo correction, foreign language support, e-mail output, bar coding, and more. While Voyager is OS/2 exploitive (with multithreading and drag-and-drop), it also supports 32-bit Windows, making it a good test-bed application for corporations comparing OS/2 Warp against Windows NT and Windows 95. The biggest downside is that Voyager offers no formal tech support. But you get what you pay for.

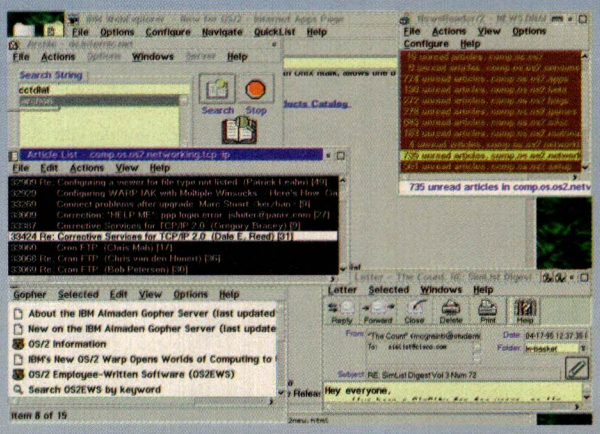

IBM WebExplorer - The Warp Pharmacy
File Options Configure Navigate QuickList Help
http://www.zeta.org.au/~jon/SwitchedWarpPharmacy.html
The Warp Pharmacy
(Sydney, Australia)
Access a bit slow? You may like to choose a Warp Pharmacy mirror site that is closer to home...
World [Australia | Europe | North America | Singapore]
Europe [Birmingham | Budapest | London | Switzerland | TeamOS/2 (Germany) | Vienna]
North America [Berkeley | Minnesota | Nova Scotia | Ontario | Pennsylvania | TeamOS/2]
Last updated: 7th July, 1995
The Tonic Shelf
The Tonic Shelf is a selection of cures to common ailments that Warp can pick up, usually when it hasn't been properly innoculated against a certain type of hardware component. It is divided into the following sub-shelves:
The News Shelf (22nd June, 1995)
The latest news about recent additions and changes to The Warp Pharmacy.
The Hardware Shelf
A selection of tonics organised according to affected hardware component.

Warp Pharmacy

Jon Seymour

Has InfoSuperCyberWebHighwayBahn mania struck the editors of *OS/2 Magazine*? No—we're still Iway-skeptics, but that doesn't mean that we can't recognize resources of genuine value. One such is the Warp Pharmacy, an all-volunteer reference area for OS/2 Warp users maintained on the World Wide Web.

Warp Pharmacy's not a help line—they don't offer forums for answering individual questions (instead, they refer you to IBM tech support or Usenet newsgroups). Rather, the Web site contains collections of questions and answers, technical facts, and a search form connected to IBM's technical support database. The support within Warp Pharmacy is broken up into logical groups for easier browsing: news, hardware, software, symptoms, procedures, and references. The home page also contains links to other OS/2 Web sites. This is one helpful page to visit—keep the address listed in our resources section handy!



Special Award: Internet Access Kit (OS/2 Warp)

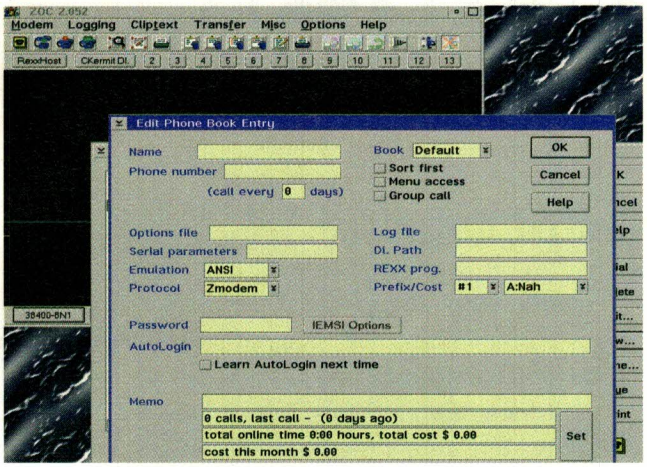
When we look back on 1995, there's no doubt it's the year of the Internet. Last year, the World-Wide Web was a curiosity; a year later, having a corporate Home Page is a business necessity. Everyone wants access to the Net—but few want the hassle of assembling the proper drivers and components, or even an add-in package.

Kudos to IBM for adding the Internet Access Kit (IAK) as part of OS/2 Warp 3.0's BonusPak. It's arguably the single most significant change to OS/2: Dial-up Internet support as part of the base operating system. Now, we're not going to say that the IAK's perfect: the dialer was late to support PPP sessions, WebExplorer was late in shipping and still isn't HTML Level 3 compliant, it's hard for a novice to use an independent Internet provider, and documentation is nonexistent. Even worse, the e-mail program, UltiMail/2, is frankly terrible. But considering that OS/2 Warp, including the IAK, sells for less than many Internet add-in packages alone, and that IBM has offered regular free upgrades to the IAK components, we believe that including IAK with OS/2 Warp is worthy of special recognition. (OS/2 Warp was reviewed in February 1995, p. 22; coverage of the IAK begins on p. 35.)

Zap-O-Comm 2.052

Marcus Schmidt

Zap-O-Comm, or ZOC, is a shareware terminal program for OS/2 that's recommended everywhere. It's not surprising, with "simplicity" a clear design goal. ZOC is easy to configure and use; basic operations such as selecting text and adding phone book entries remain simple due to thoughtful interface design. But ZOC offers more than basic functionality, with REXX support and scripting features included, as well as GIF and



JPEG file viewers. Unlike most terminal programs, ZOC can also download files using CompuServe's proprietary (and very efficient) B+ protocol.

Like many shareware offerings, ZOC is frequently updated and expanded—and not only by the author. Thanks to its developer interface, other programmers can write add-in modules: the file views and CompuServe B+ protocols are two examples. That's more flexibility than is usually found in many commercial products! (ZOC was reviewed in April 1995, p. 49.)

The award winners were chosen by Alan Zeichick, Editor-in-Chief, Guy Wright, Executive Editor, and Alexander Antoniades, Associate Editor.

RESOURCES:

ColorWorks 1.0 ($495)
SPG Inc.
15505 Bull Run Rd. #303
Miami Lakes, FL 33014
(305) 362-6602
fax (305) 823-2753
74723.3437@compuserve.com
READER SERVICE NO. 163

File Manager/2 2.32 (shareware: $50 personal, $95 corporate)
Barebones Software
CompuServe: fm2.zip and fm2util.zip in OS2USER Library 4.
Internet: ftp://ftp.cdrom.com/pub/os2/diskutil/fm2_232.zip and fm2util.zip
READER SERVICE NO. 164

Galactic Civilizations 1.05 ($59.95)
StarDock Systems Inc.
13405 Addison
Gibraltar, MI 48173
(313) 782-2248, fax (313) 782-9868
75763.3515@compuserve.com
READER SERVICE NO. 165

Impos/2 1.2 ($99)
NovaStar Software & Consulting GmbH
Ulmer Str. 160a, Eingang K
86156 Augsburg, Germany
+41 821-441820, fax +41 821-443859
100042.3004@compuserve.com
READER SERVICE NO. 166

PartitionMagic 1.0 ($129.95)
PowerQuest Corp.
1380 West Center
Orem, UT 84057
(800) 379-2566, (801) 226-8977, fax (801) 226-8941
74601.354@compuserve.com
READER SERVICE NO. 167

Performance Plus 3.0 ($39.95)
Clear & Simple Inc.
P.O. Box 130
West Simsbury, CT 06092
(203) 658-1204, fax (203) 651-0354
75070.2520@compuserve.com
READER SERVICE NO. 168

PMMAIL 1.1 (shareware: $30)
SouthSide Software
CompuServe: pmml11.zip in OS2SHARE, Library 1
Internet: ftp://ftp.cdrom.com/pub/os2/network/tcpip/pmmail11.zip
READER SERVICE NO. 169

Voyager CD ($49)
DeScribe, Inc.
4820 Bayshore Drive, #D
Naples, FL 33962
(941) 732-5500, fax (941) 732-5415
READER SERVICE NO. 170

Warp Pharmacy
Jon Seymour
There are several mirror sites. You might want to start with one of the three below, and from there, access an updated list for the location nearest you:
Australia (main site): http://www.zeta.org.au/~jon/WarpPharmacy.html
California:
http://godzilla.eecs.berkeley.edu/os2/pharmacy/WarpPharmacy.html
United Kingdom:
http://www.idiscover.co.uk/os2/pharmacy/WarpPharmacy.html

Zap-O-Comm 2.052 (shareware: $90)
Marcus Schmidt
CompuServe: zoc2052.zip in OS2SHARE, Library 1
Internet: ftp://ftp.cdrom.com/pub/os2/comm/zoc2052.zip

PartitionMagic™

For DOS and OS/2

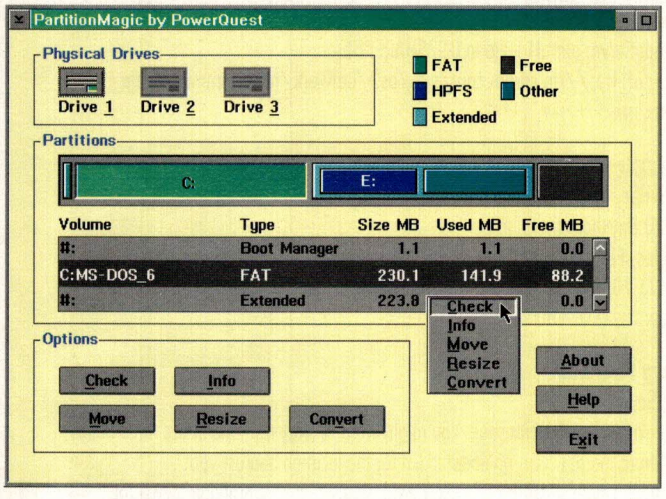
Introducing

THE ONE AND ONLY

way to visually shrink, expand,

move and convert

hard-disk partitions.



PartitionMagic supports DOS and OS/2 in one box.

Remodel your hard drive.

Until now, modifying hard-disk partitions was a tedious and error-prone process that required several time-consuming steps. You had to back up your files, delete your old partitions, create new partitions, format the new partitions, reinstall the operating system, and finally, restore your files to the new partition. If you made any mistakes or needed to make other changes, you had to repeat the entire process.

The Magic Way

Configuring hard-disk partitions takes just a moment with PartitionMagic. You can shrink, expand, move, and convert your hard-disk partitions interactively and immediately see the results. And PartitionMagic doesn't use any TSRs or other device drivers! PartitionMagic includes DOS and OS/2 executables to fully support your operating system configuration.

Convert FAT to HPFS

PartitionMagic also lets you convert any FAT partition to an HPFS partition with a click of your mouse, and you won't lose any data!

So remodel your hard disk today (not to mention your schedule) with PartitionMagic for DOS and OS/2. From PowerQuest, the file system experts (patent-pending).

POWER PQ QUEST

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Tel: 801-226-8977 Fax: 801-226-8941
CompuServe: 74601,354

EDITORS' CHOICE AWARD OS/2 MAGAZINE 1995

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OS/2 Warp Connect meets Windows for Workgroups

The latest version of OS/2 Warp is easier to connect to the corporate version of Windows 3.x. By David Moskowitz

When IBM shipped OS/2 for Windows 2.1, it was great, but it didn't install on top of Windows for Workgroups. Even if you found a way to fake it, you still lost the use of Windows peer networking capability. Workarounds were indeed possible, as Matt Trask discussed in "Peer to Peer Networking" (February 1994, p. 75), to restore some degree of networking. But in many cases, the cure could be worse than the disease.

Fade out OS/2 for Windows 2.1, fade in OS/2 Warp "for Windows" (red box, uses your existing DOS and Windows), which now has the ability to install on top of Windows for Workgroups—but took away Windows for Workgroups support for peer-to-peer networking. Finally, in May 1995, IBM released OS/2 Warp Connect, a "full pack" (or blue-box, includes DOS and Windows support) version of OS/2 Warp with additional networking capability. The version of Windows that comes with OS/2 Warp Connect is IBM's version of Windows 3.1, not Windows for Workgroups 3.11. However, you can still make your existing Windows for Workgroups tools work with OS/2 Warp Connect.

New installation

Let's make the assumption that you're installing OS/2 Warp Connect with peer-to-peer support on top of a system running Windows for Workgroups 3.11. Before you start the installation, write down information from Windows for Workgroups: Table 1 shows the Windows for Workgroups computer information you should record and the corresponding information you will need to supply when you install Peer for OS/2.

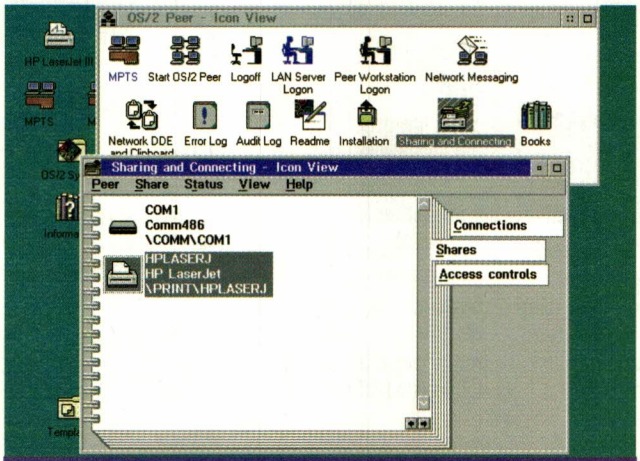

Figure 1: After OS/2 Warp Connect and Peer for OS/2 services are installed, you can share the same resources from the OS/2 workstation using the Sharing and Connections object in the Peer for OS/2 folder.

Also, launch the Windows File Manager and Print Manager and record the share names and comments for shared directories and printers. After OS/2 Warp Connect and Peer for OS/2 services are installed, you can share the same resources from the OS/2 workstation using the Sharing and Connections object in the Peer for OS/2 folder (see Figure 1).

Installing OS/2 Warp Connect is, in many cases, relatively painless, although some systems apparently refuse to work with this new version—we're not sure why. The OS/2 Warp Connect installation routines guide you through a standard installation (your choice, Easy or Advanced) immediately followed by the network installation. You've probably noticed that OS/2 Warp Connect is only supplied on CD-ROM, which is actually a good idea, since it takes as long as 45 minutes to install from CD-ROM. You wouldn't want to sit through a floppy-disk installation of this product!

Migrating applications

Whenever I install OS/2 Warp (any flavor) on an existing Windows system, I instruct OS/2 Warp to skip adding (migrating) existing applications to OS/2 during the installation. I prefer to run this step after I've had a chance to install drivers for other devices, such as tape or Bernoulli drives, as well as disk-compression software. Even if you don't have these devices and applications, it is still a good idea to defer the process until you're certain OS/2 Warp Connect installed correctly.

No matter when you run OS/2 Add Programs (or Migrate), you have to work around one shortcoming:

Table 1. Peer for OS/2 equivalence for Windows for Workgroups.

Windows for Workgroups name	Peer for OS/2 equivalent
Computer Name	Workstation name
Comment	Description
Workgroup	Domain name
Logon name	User ID
Password	Password

The facility sets up objects that might look correct but don't always work because Win-OS/2 doesn't include some files these applications need. This situation is especially true for Windows applications in OS/2 Warp Connect full pack (blue box) environment. Let's look at some potential problems:

- **Missing *.dll* files.** Your end users comfortable with the Windows for Workgroups File Manager might wish to continue using it even after migration to OS/2 Warp Connect, because it has more features than the version provided with OS/2 Warp Connect's Win-OS/2.

  Try running File Manager after you install OS/2 Warp Connect and you may see a message, "Cannot find COMMCTRL.DLL." The problem is, *commctrl.dll* or other required Windows dynamic link libraries (DLLs) are in the wrong place. As the messages occur, copy them from your *\windows\system* directory to the *os2\mdos\winos2\system* directory. Once you copy the files and set the working directory for the OS/2 program object to be the *\os2\mdos\winos2* directory instead of the *\windows* directory, File Manager will work properly (see Figure 2).

  Some of the *.dll* files are quite large. Make sure you have enough room on the partition that has the *winos2* directory tree; although we've assumed drive *c:* in this article, you may have installed either *windows* or *winos2* on a different drive.
- **Missing *.ini* files.** Some applications will have the necessary executables or *.dll* files, but won't have proper Windows initialization (*.ini*) files. In a similar fashion, you can solve this problem by copying the appropriate *.ini* files to the *winos2* directory. For example, if your staff uses Lotus Freelance for Windows, you can make it run if you copy the *lotus*.ini* and *flw2.ini* files from *windows* to *winos2*.
- **Missing *win.ini* information.** Other applications will need entries in the correct *win.ini* file; you'll need to copy information groups, known as stanzas, from the *windows\win.ini* file to the *\winos2\win.ini* file. Don't move the entire *win.ini* file!

  For example, to make PageMaker version 5 work, copy the **[ALDUS]**

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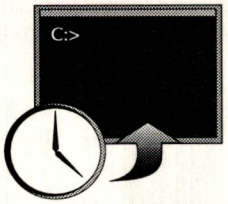

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stanza from the Windows *win.ini* file into the WIN-OS/2 *win.ini* file.

- **More than one needed.** A few applications require that you take multiple steps. For example, to make Microsoft Word for Windows 6.0 work with OS/2 Warp Connect (without reinstalling Word), you will need to copy *winword6.ini* to the *winos2* directory. If you want to use the applets that come with Word (such as Microsoft Draw or the text converters) you must also merge the appropriate *windows\win.ini* stanzas into *winos2\win.ini*.

OS/2's network support

Windows for Workgroups 3.11 ships with a number of network-aware applications, including Hearts, File Manager, NetWatch, and NetDDE. You can use some of them, but not all, transparently in OS/2 Warp Connect.

Once you are logged onto the network from OS/2 Warp Connect, you can access network resources from any network-aware application, including OS/2, Win-OS/2, and DOS command-line sessions. OS/2 Warp Connect pro-

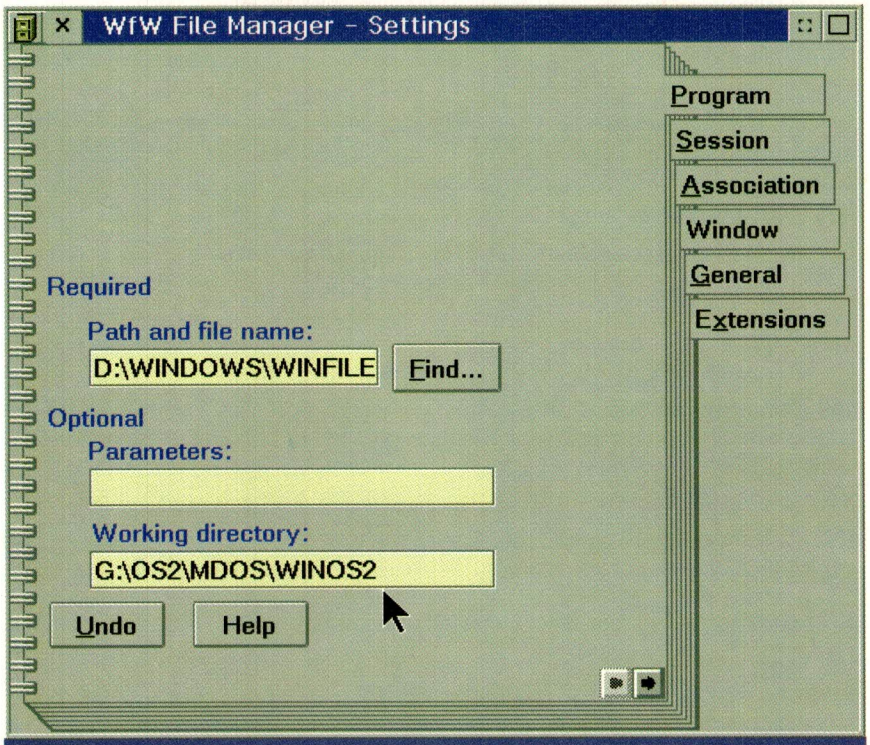

Figure 2: Once you copy the files and set the working directory for the OS/2 program object to be the *c:\winos2* directory instead of the *c:\windows* directory, File Manager will work properly.

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What's in OS/2 Warp Connect?

OS/2 Warp Connect (blue box, the version that includes Win-OS/2, IBM's version of Windows 3.1) includes OS/2 Warp, BonusPak, cumulative bug fixes, and new device drivers, plus:

Peer for OS/2 provides the ability to use multiple OS/2 workstations in a peer network—that is, without a dedicated server.

MPTS (Multi-Protocol Transport Services) provide network adapter support and replaces LAPS (LAN Adapter Protocol Services).

OS/2 LAN Requester and **Novell NetWare Requester** provide the ability to connect to a server-based network using either IBM's LAN Server or Novell's NetWare.

TCP/IP provides the ability to use TCP/IP either dial-up or networked. The minimal TCP/IP package included with the OS/2 Warp Bonus Pak only supports dial-up access. Do not install the Bonus Pak Internet Access kit if you install OS/2 Warp Connect TCP/IP!

LAN Distance Client provides the ability to use any network protocol over a phone line to connect to either a LAN Distance Server that supports multiple-port-access to the entire network, or to another LAN Distance Client that allows access to the single workstation.

NetWork SignOn Coordinator allows single log-on to multiple network systems or domains.

FFST/2 (First Failure Support Technology) allows network administrators (in a non-peer environment) to monitor and respond to errors that occur on OS/2 Warp computers over the network.

The following two options must be installed separately:

Lotus Notes Express is a limited function version of the Lotus Notes groupware product.

AskPSP is a technical support database derived from IBM's technical support services that includes answers to many OS/2 questions.

vides the same directory and printer sharing that is part of Windows, and extends it to allow OS/2 network sessions to share serial ports on one or more workstations. (Windows for Workgroups workstations cannot use OS/2's shared serial ports.)

You may want to use your Windows for Workgroups File Manager because it has more features than the version that comes with Win-OS/2. However, you cannot use the Windows for Workgroup's File Manager or Print Manager to change the "sharing" status of files or printers. To share resources in OS/2, you must use the OS/2-supplied object.

Windows for Workgroups does not support OS/2 Extended Attributes (EAs). Consequently, if you try to copy files that have associated extended attributes to a Windows for Workgroups workstation, you will have trouble; the extended attributes are lost on the target Windows for Workgroups system.

Microsoft's Hearts game works great in a Peer for OS/2 network. In many cases, you'll have a better game if you play against real people instead of the computer.

The Windows network administration tools (ClipSrv, NetWatch, and NetDDE) do not work in OS/2 Warp Connect. That's okay: They aren't needed because OS/2 Warp Connect supplies similar capabilities.

Connecting to Windows for Workgroups networks

OS/2 Warp Connect workstations run-

Table 2: OS/2 Warp Connect Requirements.

The following table shows the real-world requirements to run OS/2 Warp Connect. In many cases, these values differ from IBM's optimistic suggestions.

Description	Hard disk space (1)	Memory required (2)
OS/2 Warp (Full Pack)	50MB[1]	8MB[3]
MPTS (Transport Services)	5MB[4]	Varies[5]
Peer for OS/2	15MB[6]	3MB
LAN Server Requester	20MB[6]	2MB
NetWare Requester	3MB[6]	2MB
LAN Distance Client	13MB[6]	6MB[7]
TCP/IP version 3.0	30MB[6]	4MB[8]
Network SignOn	1MB[6]	2MB
FFST/2 (Failure Support)	1MB	2MB

Notes:

1. Extra disk space for OS/2 Warp, the network components, and temporary files is required during installation. See the README files for instructions to delete them after installation is complete. Win-OS/2 can be installed on any drive; it does not have to reside on the boot volume.
2. The memory required is not cumulative. With 16MB RAM, you can run everything, even though the total appears to suggest 30MB is required. OS/2 Warp, Peer for OS/2, LAN Server requester, or the Novell Requester (one of these three) and TCP/IP will run very nicely in a 12MB system. More memory is always better, of course.
3. IBM claims that OS/2 Warp Connect requires 8MB RAM, compared to the earlier 4MB claim for OS/2 Warp.
4. OS/2 Warp Connect copies every known adapter driver to the hard disk.
5. The memory required depends upon the network adapter drivers and protocol stacks that are loaded.
6. Does not have to be installed on the boot volume.
7. You should have at least 12MB RAM for LAN Distance client and 16MB if you want to run it with other components or software.
8. You should have at least 8MB to run TCP/IP by itself and 12MB if you want to use it with other components or software.

ning Peer for OS/2 can access shared resources provided by workstations running Windows for Workgroups. Here's some information that you might need to speed the learning curve:

- If a Windows shared resource is password-protected and the OS/2 logon password doesn't match the resource's password, you will see a dialog that prompts for the appropriate password when you try to connect to it.
- If the OS/2 domain names match the Windows for Workgroups workgroup names, the OS/2 workstation can browse Windows shared resources. Browsing is limited to accessible domains. These include the logon domain and the default domain. You can reach other domains using the **NET CONFIG REQ /OTH:** domain names. You may have to add **LAN Announce = Yes** to the **ibm** stanza in the Windows for Workgroups *system.ini* file.
- If you want to connect to a Windows for Workgroups or Peer for OS/2 shared resource from the command-line, you should use the **NET USE** command with the following format:

```
NET USE local_name shared_resource_name
```

For example, if you want to access a shared directory on another system, you could use a command similar to:

```
NET USE M: "\\ram system\xfer directory"
```

To access a shared resource with an embedded space, put the entire string in quotation marks.

- If you want to print on a Windows for Workgroups shared printer, you must install the appropriate OS/2 printer driver on the OS/2 Warp Connect system and then point it to the shared Windows for Workgroups printer.
- Once connections are established to shared resources, OS/2 Warp's drag-and-drop facilities work (whether the resource resides on an OS/2 Warp Connect workstation or one running Windows for Workgroups).
- Windows for Workgroups 3.11 adds a new utility (not present in 3.1) called WinPopup. It works with the OS/2 Warp Connect peer Network Message utility.

Summary

We've waited a long time to be able to use OS/2 in small networks without requiring a separate server. OS/2 Warp Connect finally provides this capability. It requires more resources (hard disk space and memory) and it works. Of course, it isn't the only game in town—since Artisoft's LANtastic for OS/2 also provides peer capability for OS/2 2.x and OS/2 Warp. But for many people who like to compare checklists, the inclusion of peer networking in OS/2 Warp Connect represents a milestone in OS/2's evolution.

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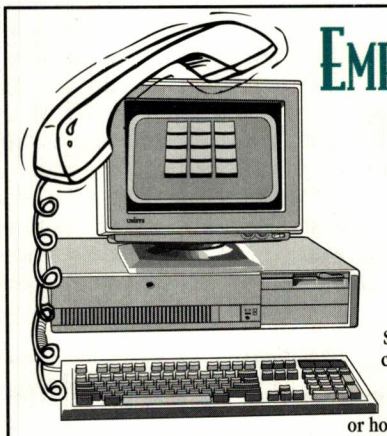

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Imperfect Symmetry

OS/2 2.11 for SMP has been out for a year. Should you care? By Paul Penrod.

The theory sounds so simple: Two Pentiums inside one computer could offer twice the performance of one Pentium. Four Pentiums—four times the performance. That's the promise of symmetric multiprocessing, or SMP. In many circles, SMP is bandied about as one of the patent medicines for the performance blues that afflict Intel-based microcomputers. Of course, the basic technology's not new: SMP-based mainframes and UNIX workstations have been around for more than a decade.

What's new is that Intel-based SMP is here and affordable (inexpensive SMP systems hover in the $5,000-and-up range), and applications and operating systems become more resource hungry by the day. Over the last several years, the value of multiprocessing has been proven in servers. With prices steadily falling, it is just a matter of time before SMP systems become the norm in mainstream hardware sales.

IBM's software answer to SMP hardware is OS/2 2.11 for SMP. Is that a direction you should consider? Let's explore the answer by looking first at how SMP works, and then how SMP PCs work. Then, we'll be ready to discuss IBM's SMP version of OS/2.

What is SMP?

"Symmetric multiprocessing" itself is a generic term, but its implementation can vary from platform to platform. For today, let's focus on SMP as it relates to the Intel environment and OS/2.

To understand SMP, we have to first understand its role in how operating systems execute applications. In modern operating systems, like regular OS/2, there are two levels of task management: multithreading and multitasking. OS/2 for SMP adds multiprocessing as a third level (see Figure 1).

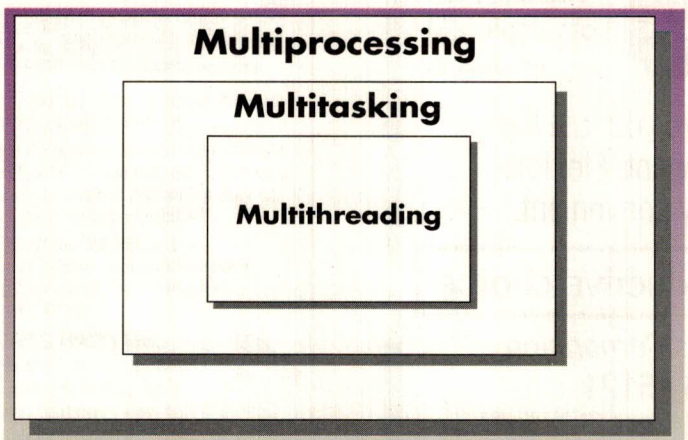

Figure 1: Task-management schema.

Multithreading. Threads are the smallest of level of execution within OS/2. A thread is nothing more than a piece of program code that does something useful. For example, in an application, one thread could be sending output to the printer while another thread could be updating the screen, and a third could be saving data to disk (see Figure 2). When this all happens at the same time, we call it multithreading. (Windows 3.x and DOS don't support multithreaded applications; OS/2, UNIX, Windows 95 and Windows NT do.) When it comes to multithreading, there is no practical difference between regular OS/2 and OS/2 for SMP.

Multitasking. A multitasking operating system manages multiple tasks (also called processes—there's a technical distinction that need not concern us here) that are running at the same time. Each of these tasks can also have more than one thread executing concurrently as it is running. Each task thinks that it's running at full speed, but in reality, the operating system lets one task run on the central processing unit (CPU, such as a 486 or Pentium) for a few microseconds, puts it on hold, runs part of another task, puts it on hold, and so-on in a round-robin fashion. One task might print, another move the mouse, and another handle a file transfer. Since OS/2 controls when tasks are given access to the CPU—and can also take the CPU away from them when their allotted time is up—OS/2's multitasking is called "preemptive multitasking."

OS/2 is a multithreaded and multitasking operating system. Each application can have multiple threads, and OS/2 ensures that all of the system's tasks (including every thread) have a

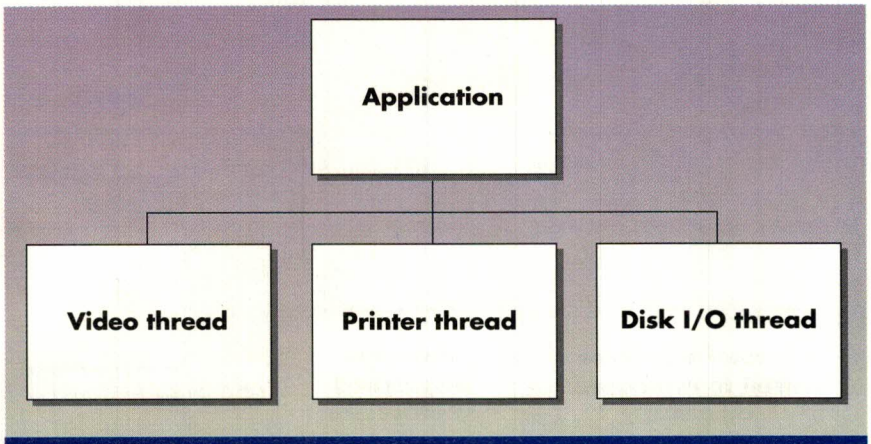

Figure 2: An example of multithreading.

share of the CPU's attention. When it comes to multitasking, regular OS/2 and OS/2 for SMP are the same. DOS doesn't multitask at all, and Windows 3.x offers a limited form of multitasking called "cooperating multitasking." Windows 95 cooperatively multitasks 16-bit Windows applications through a single message queue in the OS. DOS applications are also controlled by this one message queue. However, the fun begins when you run a Win32 application. Windows 95 will set up a message queue for each Win32 application plus a separate task space so that they are isolated form each other. This alleviates some of the GPF problems that occur regularly with Windows 3.x as they stomp on each other's resources. The bottom line in Windows 95 is that 16-bit Windows applications and DOS applications are cooperatively tasked in a single message queue, while Win32 applications are preemptively multitasked and each have their own message queues. UNIX and Windows NT offer preemptive multitasking similar to OS/2's.

Multiprocessing. Multiprocessing itself is an advanced form of multitasking. Instead of scheduling all the tasks to run in tiny time slices on a single CPU, it splits them between multiple microprocessors. The multitasking operating system (in this case, OS/2 for SMP) plays office manager, distributing applications and their threads between all the CPUs installed in the system so that each stays busy doing something useful.

When the multiprocessing task manager attempts to keep the work load about the same for all CPUs in the system (load balancing), we call it symmetric multiprocessing, or SMP. When scheduling a task is done based on the next available CPU, and the issue of load balancing is secondary, we refer to it as asymmetric multiprocessing, generally abbreviated as MP.

This additional layer of task management—spreading threads and tasks between multiple CPUs—is what separates OS/2 2.11 for SMP (the only version that IBM has shipped) from all other versions of OS/2.

Intel-based multiprocessing

One thing can be said about Intel's microprocessor strategy: It makes advanced computing concepts affordable. SMP is one of the latest ideas to receive such focus in a technical specification called MPS 1.1, which Intel published in September 1994.

Intel's MPS model provides the basis for SMP in two very important ways: memory symmetry and I/O symmetry. With memory symmetry, all of the CPU chips installed in a PC share the same memory space and can move data back and forth using a single address. This ability is important, because memory symmetry allows all the processors in a system to run a single copy of the operating system. The benefits are that less memory is consumed by the operating system, and that we know all applications should run regardless of how many CPUs are stuffed onto the motherboard.

I/O (input/output) symmetry is similar. All CPUs have access to and share I/O ports and interrupt controllers. While it's outside the scope of this article to discuss the details of how it is done, all you need to know is that MPS allows interrupts to be handled two different ways.

PIC mode. A single processor is a designated "traffic cop" and handles all the interrupts and I/O traffic. All processors in the system can issue interrupt requests, but only one of them services those interrupts. This makes the hardware able to continue to directly support legacy software that expects to

OS/2 Warp for SMP?

OS/2 2.11 for SMP is a fairly new kid on the block. First introduced at PC Expo in June 1994, OS/2 2.11 SMP brought some interesting promises from IBM, including performance advantages in OS/2 for SMP's multithreaded kernel. With OS/2 3.0 being beta-tested, everyone looked forward to an OS/2 Warp for SMP to appear shortly after the release of the main operating system that fall.

In November 1994, shortly after OS/2 Warp 3.0 was introduced, IBM's marketing executives indicated a change in direction, downplaying the arrival of an OS/2 Warp for SMP. Instead, they hinted that a minor upgrade of OS/2 2.11 Warp for SMP might arrive in late 1995. Although it would still be an OS/2 2.x-level product, it would support Advanced Programmable Interrupt Controllers (Intel's new interrupt controller for SMP systems).

Which brings us up to the present. As of mid-July, IBM's Personal Software Products division, the group within IBM that builds and markets OS/2, hasn't been able to provide any additional information about the status of OS/2 for SMP—it's even difficult to obtain information about the current version. We don't know whether IBM's unresponsiveness is a symptom of the incredible pressure to ship OS/2 for PowerPC, or indicates a general lack of interest in symmetric multiprocessing.

Barring any new announcements on IBM's part, it would be safe to presume that, by the time you read this article, OS/2 2.11 for SMP will still be the current version. So, if you're dependent on the new functionality in OS/2 Warp Connect, if you've written applications to take advantage of new OS/2 Warp functions, or if you need OS/2 Warp's improved Windows 3.x compatibility, you might as well put your SMP plans on the back burner.

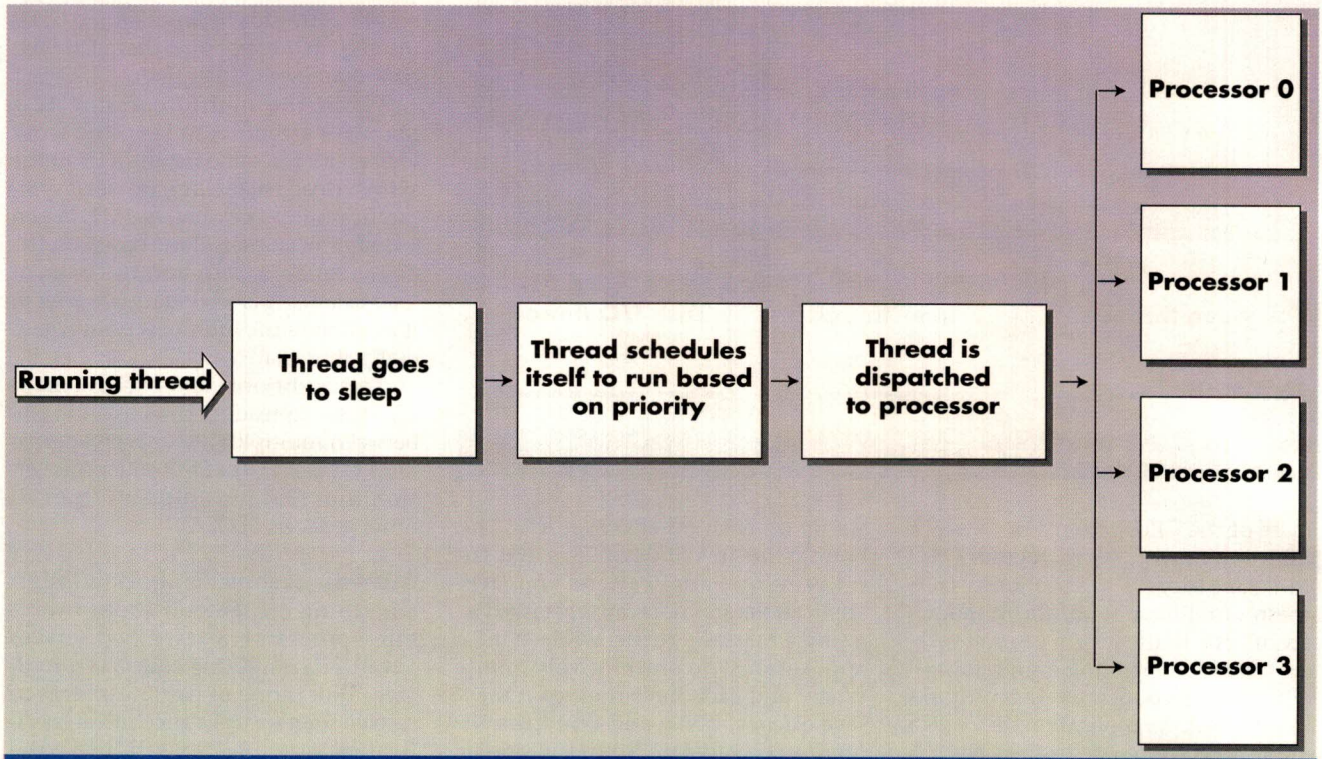

Figure 3: The OS/2 SMP scheduler.

"see" only one processor in the system, such as DOS or Windows 3.x applications. This mode is also referred to as "Compaq Style" interrupt handling. More on this subject in a moment.

Symmetric I/O mode. All processors in a system issue and service interrupt requests. Windows NT handles its interrupts in this fashion. This mode is *not* backward compatible with legacy software, so it's up to the operating system to provide a sophisticated emulator that can handle DOS or Windows 3.x applications

When an Intel-based multiprocessing system is booted, the specifications call for the hardware to start up in PIC mode, so the computer looks like an ordinary IBM-PC AT-compatible system with one processor. It's the multiprocessing operating system's job to reconfigure the hardware, if necessary, to meet its needs.

Multiprocessing under OS/2

When OS/2 2.11 for SMP is booted on a multiple-CPU computer, several things take place:

- First, OS/2 locates all of the additional CPUs, and determines their addresses.
- OS/2 then loads Platform Specific Drivers (PSDs), which are special device drivers that compensate for the lack of true standards in the Intel multiprocessing world.
- OS/2 loads and configures Presentation Manager, the Workplace Shell, and any other necessary runtime programs to get the system running properly.

OS/2 for SMP follows the "Compaq Style" of interrupt handling, which makes supporting existing hardware, DOS, and Windows 3.x applications much easier. Since one processor handles all the interrupt traffic, many DOS and Windows device drivers that interface with I/O ports and interrupts can still operate without interfering with the operating system, and without the need for slow emulators. The additional hardware underneath the OS/2 operating system layer should not interfere at all with existing DOS or Windows 3.x applications, or with native OS/2 applications. If these applications run on the single CPU version of OS/2 2.11, then they should run without problems on OS/2 2.11 for SMP.

User perspective

From the user's perspective, OS/2 2.11 for SMP is almost identical to regular OS/2 2.11 in how it looks and behaves, with the exceptions of the SMP Monitor utility and a modified task scheduler.

SMP Monitor is unique to this version of OS/2. As you'd expect, it's a performance monitor and, as is true with other performance monitors, you can watch CPU utilization as it occurs. Since we're working with multiple processors, however, SMP Monitor offers you some control: You can shut down or start up any of the CPUs on the fly to adjust system performance. You might use this feature, for example, to force single CPU operation for an application that requires it. The ability to accomplish this feat lies in the way OS/2's task scheduler handles threads. This ability only works with CPUs other than PROC 0, the bootstrap processor that is currently handling I/O requests. On a two-processor system, SMP will let you play with PROC 1, but only look at PROC 0.

OS/2 2.11 for SMP's task scheduler, like regular OS/2's equivalent, is really a dispatcher. As threads finish their allotted time of execution on a CPU, they immediately request permission to run again. How soon this permission will be granted is determined by their priority (which they keep internally). The task scheduler's responsibility is to wake up these threads at the right time and hand them to a CPU to be executed (see Figure 3).

The difference between OS/2's SMP scheduler and a non-SMP scheduler has to do with which processor to hand these threads to. With a single CPU in the system, the choice is academic, but when two or more processors are running, fast decisions need to be made—mostly for performance reasons.

Under OS/2 2.11 for SMP, threads keep their vital information in an internal Thread Information Block. It is within this block that the location of the last CPU the thread ran upon is stored. This technique for optimizing application thread scheduling is referred to as Processor Affinity. Since CPUs cache information on a temporary basis, if a thread is returned to its previous CPU for execution, there's a much better chance of finding their data right where they left it. "Waking up" on a different processor ensures that a thread will have to flush the CPU cache and waste time going to memory to get working data. This translates into slower applications.

OS/2 2.11 for SMP takes advantage of multiprocessor hardware to run more applications concurrently with better performance than OS/2 2.11 on a single CPU machine (all other hardware being equal). You won't see any changes in how you do things in the Workplace Shell or within applications, since everything (except for SMP Monitor) is hidden from view and happens automatically.

What about performance? Much depends on how well even native OS/2 programs are designed and written. Fully threaded OS/2 applications have approached "perfect" scalability—in one test, a four-CPU system in a well-threaded application ran nearly four times as fast as an identical single-CPU machine. DOS and Windows 3.x tasks, which aren't multithreaded, can also take advantage of SMP, since most of OS/2's own overhead can run on one CPU, while the application has access to another. In those cases, my experience shows a performance benefit of up to 35% on a dual-processor system (in that particular case, running a Microsoft Word 6.0a for Windows macro with a long print job in the background).

Performance considerations

The only reason to purchase an OS/2 for SMP-based system is for performance, pure and simple. Here's an application of the old hot-rod adage: "Speed is a function of money. How fast can you afford to go?" There are several architectural features to consider when shopping for SMP hardware; the features themselves are relatively operating-system independent. They include:

Memory. Insufficient memory is always a problem, no matter which operating system you're using, but particularly under SMP. Many SMP hardware vendors like to offer systems with two CPUs and 16MB RAM as a baseline—forget it! When the system has insufficient memory to share, the CPUs fight over it and stall each other, resulting in a big performance penalty. Sure, OS/2 2.11 for SMP will *run* in 8MB RAM, but application response is miserable. The amount of memory I have observed under testing as a good rule of thumb for reducing CPU contention is 16MB per installed CPU.

Split memory bus. By splitting the bus to allow multiple data paths to memory (sometimes called multiported memory), more data can be sent back and forth between CPUs and RAM per unit time. This approach also reduces a condition called processor stalling, where the CPU has to halt execution and wait for memory access to occur, or for the memory bus to become available. Normally, a DMA bus might run at 267MB per second between processor and memory. While this is quite fast, you can still hammer it with just two 90MHz Pentium processors running full tilt. A split bus allows over 534 MB per second to be shuffled back and forth.

PCI bus. Providing a PCI bus for high data-traffic peripherals, such as SCSI controllers, graphics cards, and high-performance network adapters, reduces processor stalling and allows more data to flow through the system. The PCI bus is capable of 140MB per second compared to an ISA bus at 8MB per second or EISA at 33MB per second.

SCSI I/O devices. These devices, especially hard disks connected to a smart controller, are consistently faster than their IDE counterparts. Aside from the fact that most SCSI hard drives can push data faster than IDE drives (especially SCSI-2 and SCSI-3 drives), IDE drives are serial devices linked on a single channel. This approach prevents another drive from sharing the channel (request interleaving) to improve efficiency.

Secondary caching (L-2 cache). The Intel Pentium CPU has a small internal cache called an L-1 (Level 1) cache. This cache stores frequently used instructions and data so the CPU does not have to wait while something is fetched from the much slower DRAM. The problem is, this internal L-1 cache is quite small. To compensate, a much larger secondary (or L-2) cache is used to boost performance. In less-expensive SMP systems (in the $5,000 range), the L-2 cache has one data path running to it from all the CPUs. Here is where the fun begins.

During processing, if one of the CPUs can't find what it's looking for in its internal L-1 cache, it looks in the shared L-2 cache. If two processors want to look at the L-2 cache at the same time, then one of them will stall until the first is finished, before continuing. As CPU stalling becomes more frequent, the performance degrades significantly—applications may run even slower than they do on a single-CPU system.

The best performance gains made with an L-2 cache come when the SMP vendor creates a "split" cache design for the motherboard. This design allows each CPU to have its own channel on the L-2 cache, which eliminates processor stalling while the CPU is waiting for the data path to the L-2 cache to become available. These refinements to the L-2 cache are usually found on systems costing in excess of $12,000, as they are very expensive to implement compared to a simple shared-cache design. Although the differences are significant even with only two CPUs, having a split L-2 cache becomes increasingly important as you add additional CPUs.

Expensive machines pay for themselves over time, especially when the duty cycle is high. The more you use the machine, the more accumulated time you will save over the long haul. It may be a few seconds per application compared to a cheaper system, but add the accumulated time over the course of a month, quarter, or even a year, and the time savings will become substantial.

Now that we know what to look for in an SMP machine, the next trick is finding one that runs OS/2 2.11 for SMP. Fortunately, IBM took the time to woo several hardware vendors into offering their machines complete with OS/2 2.11 for SMP support (in some cases, preloaded). At present, qualified vendors include Advanced Logic Research, AST Research, Compaq, Everex Systems, Tricord Systems, and Wyse Technology.

Is it worth it?

The question of whether to invest in expensive SMP hardware, as opposed to merely buying a higher-powered single-CPU system (or splitting tasks among several separate PCs) is a difficult one. If your computer work is very CPU-intensive, or if the problems you solve are quite large in their scope, OS/2 2.11 for SMP may be just the thing to make your work more efficient. On the other hand, if your work involves word processing, telecommunications, and an occasional dabble into spreadsheet or graphics-presentation software, the power of OS/2 for SMP will be wasted. Users who would benefit the most from OS/2 for SMP include:

- Power users who keep many programs running and active all the time.
- Software engineers and programmers who work on larger projects requiring many recompiles and long batch processes.
- Desktop publishers who manipulate large amounts of text and graphics without delays.
- Graphic artists who use high-definition scans, renderings, special effects, or fractal math.
- Systems administrators who want to monitor and manage a complex network from their desktop.
- Scientists and researchers who work on statistical or cascading problem solving.
- Computer-aided design and manufacturing designers who render drawings in 3D.

OS/2 2.11 for SMP is not for everyone, and not only because the latest applications are being written for OS/2 Warp 3.0, and won't run under any flavor of OS/2 2.x. Traditional MIS wisdom would argue that SMP does not belong on the desktop, but only in servers. The reality of the kinds of large-scale business, scientific, and data-processing problems that users are expecting their PCs to address these days belies that mentality in spades.

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Inside the IBM Works PIM

Mastering IBM Works' Personal Information Manager module. By Lou Miranda

There's much more to IBM Works than just a word processor. True, that's what we covered in "Understanding IBM Works" (May 1995, p. 37), but now, let's find out just how indispensable the personal information manager (PIM) can be to your daily routine. We'll continue with the adventures of the fictitious company established back in May, Next Generation Consulting, using the PIM to handle prospects, fax announcements, make name tags, schedule and place phone calls, and create folder associations.

Keeping Contact

As the president of Next Generation Consulting (NGC), you attended an important industry conference and came back with a stack of business cards from potential clients. Now what do you do?

The first thing you'll probably want to do is enter them into Works' Phone Book. Once you do that, you can have Works dial your phone for you, help take notes on phone conversations, schedule appointments automatically, perform mail merges with the word processor, create mailing labels and envelopes, and organize people into contact lists.

Let's add an entry for your first potential client, Mary Lee. Open the Works folder, then open the Phone/Address Book. Right-click in the Phone Book and select New. Up comes a Notebook with six tabs. On the first page, General, enter the contact information including her company name and address. The Secondary page is for home information, if available. On the Phone page, you can enter as many as eight phone numbers. If you want to use IBM Works to perform a mail-merge and fax automatically, make sure one of the phone numbers has the word "fax" in the "Label" field.

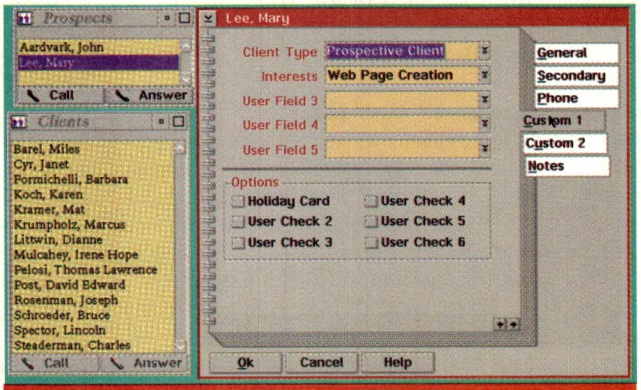

Figure 1: Prospects and Clients contact lists, and customizable fields in the Phone Book.

The last three tabs in the notebook are for your own information (see Figure 1). Custom 1 and Custom 2 allow you to have a total of 10 user fields and 10 check boxes. For our example, we'll use one of the user fields to distinguish between Prospective Clients and Clients, and another one for Special Interests. In User Field 1, enter "Prospective Client," and in User Field 2, enter "Web Page Creation." (You might want to use one of the check boxes for holiday-card list, for example.) The last tab is for the Notes page, which lets you enter any free-form notes about the person. Here, put in a note that Mary knows one of your best clients—information that might be vital later.

Now click the Add button to add Mary to your Phone Book. You can continue to type in additional contacts. When you get to the Custom pages, you can click on the arrow to the right of the field and select text that you've entered previously, making data entry go much faster. Click Add, then click Quit when you're done.

How do you remember if User Field 1 or User Field 2 was for Special Interests? Easy: You can rename the fields in PIM Preferences. To get there, right-click on the top of the Phone Book where it says Name or Phone. Select Launch-> Preferences. Select the Phone Book tab, then click once on the right-facing arrow at the bottom. Next to User Label 1, type "Client Type," and next to User Label 2, type "Interests." Close the Preferences notebook, and double-click on Mary Lee's name. Select the Custom 1 tab and it now says "Client Type" and "Interests."

As a growing company, NGC has more prospects than it does clients. But eventually you'll have a large number of clients, too. How do keep track of them? You set up contact lists to keep them separate. It's a three-step process:

Announcement
File Edit View Character Paragraph Document Objects Help
Bitstream Iowan C 30
{First Name} {Last Name}
is cordially invited to a
Free Seminar!
Sponsored by
Next Generation Consulting
"Creating Web Home Pages on the Internet"
Page 1 Pg 1 Ln 1 Col 3 INS

Figure 2: The seminar announcement will be automatically merged and faxed to all prospects.

create a contact list, filter the Phone Book names, then drag the filtered names to the contact list.

Start by right-dragging from the Contact List template from your IBM Works folder onto the desktop. Rename it "Prospects." Now, right-click on the top of your Phone Book (where it says Name or Phone) and select Filter. Next to Filter Key, select "Client Type"; next to Filter Criteria, select "Prospective Client." Select New Search, and then press OK. Now only names of matching entries will be displayed. Right click at the top of the Phone Book and select Select->Select All. Then right-drag from the Phone Book to the Prospects contact list. Double-click on Prospects to open it; only the names you dragged should appear. Go back to the Phone Book, right-click at the top, and select Filter-> Clear to restore all the names. OK, the hard work of entering prospect names by hand is done. Now, to convert them to paying clients...

Broadcast faxing

Let's hold a free seminar in your area of expertise. Once prospects are dazzled with your knowledge and presentation skills, they'll happily pay handsomely for your consulting services, right? Let all your prospects know about the seminar by faxing them an announcement.

Create the announcement in Works' word processor (see Figure 2). Customize the announcement for mail merging by inserting codes for the prospects' first and last names (Document->Mail Merge, and then Edit->Insert Data Field). Don't forget that the word processor has drawing tools (View-> Draw Palette) and can import many graphics types (File->Import Picture).

Once your announcement has been created, you will want to fax it to your prospects. This is the fun part: Just drag your Prospects contact list icon onto the icon for your announcement. The icon for the announcement should now have a small business card in the lower right corner. Now, drag this icon to the FaxWorks Lite icon (another part of the OS/2 Warp BonusPak) and your announcement will be automatically faxed to all your prospects. Easy!

What happens behind the scenes is that Works looks up each Prospect's name in your Phone Book, selects the first phone number with the word "fax" in it, mail merges that name with your announcement, and faxes it to the appropriate number. Best of all, you don't even know this is going on. All you have to do is drag and drop.

Badges? Badges?

The day before the free seminar, you decide to make name tags for the attendees. It will help promote your company, give a less formal air to the seminar, and prevent the embarrassment of forgetting a potential client's name!

While Works' PIM module can print detailed or summary reports, and can also print mailing labels (right-click in the Phone Book and select Print-> Mailing Labels), it can't do everything—and that includes creating fancy badges. Luckily for you, the PIM stores its data in a standard dBase IV format, and Works' database module can read dBase files. So, let's go into the database and create name tags. (At this point, I'll assume you have some blank, letter-sized paper with a self-adhesive backing lying around.)

Go to the Works folder and right-drag the Database template to your desktop. Rename the object "Hi My Name Is," then double-click to open it. When the New Form Options dialog pops up, select Use Existing Database and press OK. In the file-selection dialog, select "DBF (dBASE IV Database)" under Type of File. Then, go to Works' data directory (probably *c:\ibmworks\data*) and select *phone.dbf*, which is the PIM's data file.

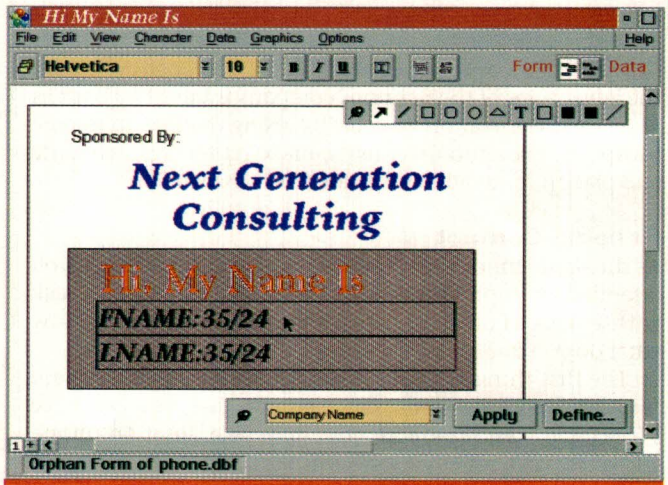

Figure 3: Name tags created in Works' Database module.

In the Database Fields dialog, select FNAME (the first-name field) and click Use. Move the mouse to the top left corner and click the left button. Click anywhere else on the page, then click on FNAME (without the box), and press Delete to delete the label. In the toolbar/ribbon, click on the button with an I-beam inside a dotted box. Select LNAME (last-name field), then Use, then move the mouse below FNAME and click. Remove the LNAME label.

Before going any further, let's set up the page to print four name tags per page. Select Options->Page Setup, then select Landscape and Labels. Select two rows, two columns, check No Label Margins, then set half-inch vertical and horizontal gutters. Click OK and then

Save. Move the LNAME and FNAME fields near the bottom center of the box.

Select View->Draw Palette to display the drawing toolbar. Click on the T (text) tool button, and type "Hi, My Name Is" and press OK. Put the mouse in the center of the page and click once. Repeat these steps at the top of the page, but type "Sponsored by Next Generation Consulting." To change the typeface, size, or color of the text, select the text with the mouse and then choose Character->Fonts... (see Figure 3).

To see how your name tag will look with a client's name on it, select the Data button on the top right of the toolbar/ribbon. Warning: Although the database module will allow you to make changes to the data, do *not* do so! That's because the PIM cross references items in the Phone Book, Planner, Contact Lists, and other modules; if you edit the *phone.dbf* data in the Database, you may break those cross references.

Before printing your name tags, you'll want to limit the printout to just your Potential Clients. Select Record-> Specify Record Select. Then double-click CUSTOM 1 under Field Name. Then click Contains, and enter "Prospective Client" next to Value, and press the arrow next to it. Click Accept. Select File -> Printer Setup, select the Setup button, and choose Landscape. Click OK, then click Save. Now choose File-> Print, choose Selected Records, Template and Data, and click OK. You should now have four name tags printed on each page, with your company name on top. (I would have recommended putting your company logo next to the name, but there's a bug in the database module: graphics only show up on the first item on a page.)

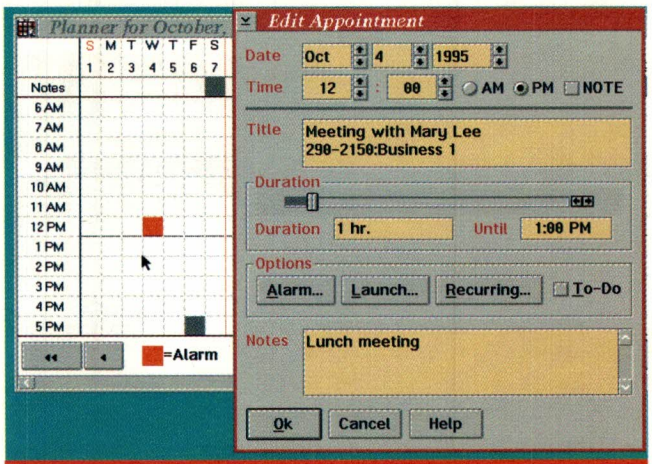

Figure 4: Setting up an appointment.

Alarming results

Your seminar was a smashing success. But everyone's busy and they'll quickly forget about you if you don't remind them. So, remind yourself to make follow-up calls to your prospects a week later.

Double-click on the Monthly Planner in the IBM Works folder to open it. Drag one of the names from your Prospects contact list to a date on the Planner grid one week from today at 9:00 am. When you drop the contact there, Works automatically pops up an appointment dialog with the name and phone number automatically filled in.

You'll want to be reminded to call this potential client, so select Alarm in the New Appointment dialog. Make sure Alarm Enabled is checked, then click OK. Now click OK to save the new appointment.

Notice that the Monthly Planner now has a red square where you scheduled the appointment. Red means you've scheduled an alarm. (See Figure 4.) Click on it with the left mouse button, and hold the mouse down. A menu will pop up, listing the appointment (if you have more than one appointment scheduled for that hour, all are listed). While still holding the mouse button down, move the mouse pointer over the appointment you want to edit or view, and then let go. You can now modify the appointment. Click Cancel to discard your changes or OK to save them.

When the appointment comes due—and you have the alarm set—a dialog will pop up with the title you entered. Remember that the Event Monitor must be running for alarms to pop up automatically. You might want to create a shadow of the Event Monitor in your Startup folder, so that it's always running.

One ringy dingy

When the alarm pops up, it's time to make your phone call. Open your Prospects contact list and select the first name with the left mouse button. Click on the Call button and a dialog pops up that lists all the phone numbers you've entered. Make sure Use Modem is checked. If it's grayed out, it means you haven't set up your modem—see "Turning on your Modem" (this page) to solve the problem.

Select the appropriate phone number, check the options you need, then push Dial. Once the phone starts ringing, pick up your phone and then click OK. The Calling notebook now displays. (If you deselected the Use Modem check box and clicked Dial, the Calling notebook should also be displayed.)

The Calling notebook is where you can take notes about your incoming and outgoing phone calls. It even maintains a phone log to help you keep track of phone calls over a long period of time.

Let's say that your first contact isn't in the office. Her secretary answers and says that she's on vacation in the

Turning on your modem

If you can't select Use Modem from the contact manager, click Cancel to dismiss the "Call" dialog box. Right-click on your Prospects contact list and select Launch->Preferences. Click on the Phone Book tab. Under Modem, select the communications port, modem speed, and phone type that's appropriate for your system Remember that to use this feature, you need to have a regular telephone connected to your modem; most external modems and modem boards have phone jacks, but many PCMCIA modems do not.

You can probably leave the Strings section alone if you have a Hayes-compatible modem (most models sold today are). However, if you need to dial a 9 to get to an outside line, enter "9,," (a nine and two commas) into the Access Prefix field; the two commas tell the modem to pause for a few seconds after the 9 and before the phone number. Enter your three-digit local area code in the Local Area Code field. That way, the PIM is smart enough to strip it off of all local numbers. This is especially useful if you move or go on a business trip and your local area code changes. Finally, make sure Enable Modem is checked. Now close the Preferences Notebook.

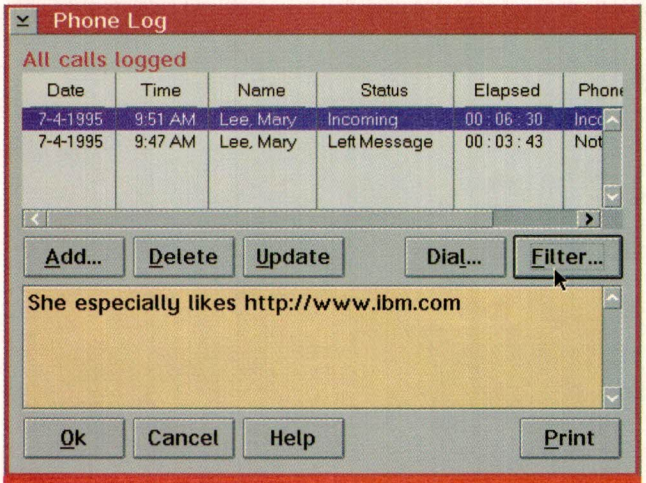

Figure 5: The Phone Log shows you a history of conversations.

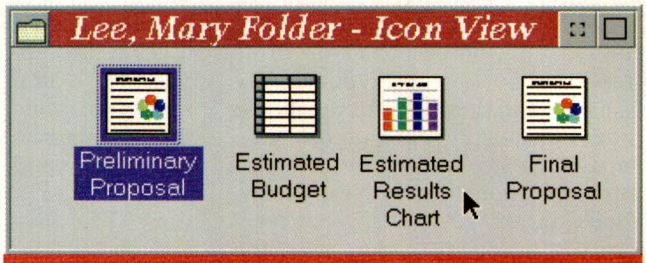

Figure 6: A custom folder for your client.

Caribbean. You leave your name and phone number and ask her to call back when she returns. So in your Calling notebook, click on Left Message, and then enter "Went on vacation to Caribbean" in the edit control. Now click Hang Up.

Two weeks have gone by and Mary Lee calls you back. The instant you realize it's her, you open your Prospects contact list, select her name, and click the Answer button. In the Answering notebook, click on the Phone Log tab. Click on the first Previous Conversation. It says Left Message, and the edit control on the bottom has your notes in it. You see that she was on vacation—ask if she had a nice time.

Now click on the Incoming tab, and enter any notes in the edit control. Mary agrees to do lunch, and mentions in passing that she likes one Web site in particular. You enter that Web site in the edit control for future reference, then click the Appointment... button to set up a lunch date. Just as before, you can set an alarm to remind yourself of the time and date. Click OK to schedule the appointment, then click Hang Up to end your note taking.

Before going to lunch with Mary, you decide to review your conversation with her, and check out the Web site she liked so much. Open the Phone Book and select the Log button (there ought to be a Log button on the Prospects contact list, but unfortunately there isn't). Click the Filter button, select All Days and Selected names, then click Set.

On the top of the Phone Log dialog, you can click on any logged phone call (see Figure 5). The top section shows details of the phone call, and the bottom has any notes you entered. You see that she liked the web site *http://www.ibm.com*, so you use Web Explorer, which is part of the Internet Connection, to view it. Click Cancel to dismiss the Phone Log.

Document centric

Success! After your business lunch, Mary decided to use your consulting services. So, drag Mary's name from the Prospects contact list to the Clients contact list. Since you'll be producing many documents for your new client—such as proposals, budgets, letters, memos, sample Web pages—it makes sense to organize them all in one place.

This is where the great advantage of OS/2 Warp's "document centric" metaphor comes into play. Rather than keeping all your word processor documents in one folder, your spreadsheets in another, and your drawings in a third, it makes more sense to organize them by topic—in this case, by client. In your office, you don't keep all your memos in one filing cabinet and your proposals in a different filing cabinet, do you? You organize them by client, and it makes sense to do the same thing on your computer.

IBM Works makes this easy. Right click on Mary's name in your Clients contact list. Select the arrow to the right of Open, then select Folder. Works will ask you if you want to create one; select Yes. A new folder called "Lee, Mary" appears on your desktop and is automatically opened.

If you have a lot of clients, you'll end up with a lot of folders that will clutter your desktop. So right-click on Mary's folder and select Create Another. Next to New Name, enter "Clients Folder." Select the Desktop as the target folder, then click Create. Now drag the icon for Mary's folder onto the Clients Folder icon. Don't worry, Works will be able to find the folder even if you move it—that's one of the great things about OS/2 Warp's Workplace Shell (and one of many reasons why it is superior to Windows 95, by the way).

Whenever you create a new document that relates to Mary, store it in her folder (see Figure 6). That way, you'll always know where it is, and you can use her folder as a "mini-desktop" where you can double-click on any document to view or edit it. To create a Works word processor document, for example, drag a Document template from the Works folder into Mary's folder.

Experimentation

Now that you know the basics, you can try a little experimentation to explore IBM Works more fully. You've seen a lot of dialogs as you went through this article, but I didn't explain every button and option. Try some of the other options available and try printing some names, mailing labels, or appointments. And remember, IBM Works' PIM makes extensive use of drag-and-drop and the right mouse button, so experiment a little and see what tricks you discover.

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Disk Compression Shootout

DCF/2, Stacker, Zipstream. BY RICK KRUER

There seems to be an unwritten law about hard disk space: No matter how much room exists on your hard drive, it will easily and continually be consumed.

Disk compression is a sophisticated technique where the power of modern computers permits a smaller, physically altered version of the original file to occupy a smaller amount of precious disk real estate. You may be gleefully thinking that you can double the size of your hard drive simply with the purchase of a software program, but it is not quite that simple. Compression is an expensive proposition that requires a detailed analysis of the data along with data manipulation to create a precise equivalent, yet smaller, version. Transparent compression operates on the notion that files are compressed and reduced in size to be stored on disk, but expanded (decompressed) in a manner that is not noticeable and ideally not detectable under normal operating circumstances. Your mission is to find a product that will perform this magic without noticeable impact on OS/2 system performance.

This article will take a look at three premiere disk-compression systems available for OS/2: DCF/2 by Development Technologies (which purchased the product from Proportional Software in July), Stacker by Stac Storage & Communications, and Zipstream by Carbon Based Software. DCF/2 and Zipstream fully support the High Performance File System (HPFS), whereas Stacker can only only be used on DOS-compatible FAT formatted disks. Stacker is essentially a mature DOS product that was made to work in OS/2. To answer the obvious question "Which disk compression package should I use?" let's take a more thorough look at some critical features.

Benchmark background

To briefly review, OS/2 includes the file allocation table (FAT) file system, which is used to represent the format of data stored on disks. FAT is compatible with DOS and is an old structure not well suited for large high-performance hard drives. The well-known bane of FAT is the need for defragmentation; the situation caused when many file updates cause file parts to be spread across the hard drive in many pieces. HPFS is an OS/2 installable file system (IFS), which is a technique that allows for IBM and third-party software developers to add new file systems to OS/2. HPFS was designed to maximize performance with large hard drives, permit the use of long file names, and resist the fragmentation problem inherent with FAT. Zipstream also functions using an IFS, but more on that topic later.

Transparent disk compression requires two steps, compression and decompression. Storing the data in its smaller form (compression) takes a much greater amount of processing power and time. Retrieving the stored data (decompression) is typically designed to be very fast, allowing for transparent access to compressed data. It may be a little painful (slower) to compress the data, but good compression software will get the original data back again without noticeable degradation to your productivity.

The benchmark used to test each of these software products consisted of measuring their ability to perform these two essentials parts of disk compression. Compression can be considered synonymous with writing to a "compressed" drive. Decompression can be thought of as reading from a "compressed" drive. To compare the performance of these products, testing was performed using the Workplace Shell Drives object to copy (read and write) four folders with a general mixture of file sizes, both large and small. The total amount of test data consisted

Pros and cons

DCF/2 Pros
- 30-day free trial
- Free technical support
- Supports HPFS
- Provides a graphical monitor of compression operations
- Trial version upgradable to full version

DCF/2 Cons
- Slow and disruptive compression
- Container based
- Optimization required too often
- Tuning options complicated

Stacker Pros
- Free support for 90 days, after that, pay-per-call is required.
- Money back guarantee for 60 days.
- DOS to OS/2 conversions
- Graphical toolbox

Stacker Cons
- Container based
- DOS required
- DOS based: no HPFS support
- OS/2 segmented installation is confusing

Zipstream Pros
- 30-day free trial
- 90-day money-back guarantee
- Excellent performance (background compression)
- HPFS supported
- File-based not container-based
- Trial version upgradable to full version

Zipstream Cons
- Automatically installs to OS/2 boot drive

of 1,400 files—about 30MB. FAT was used for Stacker, HPFS for DCF/2 and Zipstream. Be careful when considering the relative performance of these products using my benchmark, since HPFS appears much faster than FAT even without the added complication of disk compression. For this reason, "relative" numbers were used to keep from comparing HPFS and FAT directly.

Container or file-based?

Like Stacker, DCF/2 is a container-based compression system, as opposed to Zipstream, which is a file-based compression system. Container-based means that real disk space is permanently allocated and a virtual (fake) larger compressed disk is created using the container file. Looking at a disk compressed with either DCF/2 or Stacker reveals a large hidden file (known as the container) where all of the compressed files reside. DCF/2 refers to the container as a virtual disk unit (VDU).

The actual space required for the container varies since disk compression is different depending on the type of file being compressed. *.Exe* and *.dll* program files compress about 1.5:1 whereas *.inf* and *.txt* text files compress 3:1 or more. (The terminology 3:1 is used to indicate a compression ratio where the data is smaller and now occupies one third of its original space.) Averaging the different files present on a typical OS/2 computer system usually yields an overall expected compression ratio of 2:1 for any compression product. This means that, for every 10MB of real disk space allocated, 20MB of compressed disk space is available for use.

But disk compression is hardly "free"—being a CPU-intensive process means it takes a great deal of computing system resources to compress files. A container-based system like DCF/2 or Stacker must compress the file before storing it on the compressed disk. A file-based system like Zipstream saves the file on the real disk in its original normal format and schedules the compression of the file in a background process.

DCF/2

DCF/2 installs fairly easily, placing its device drivers into *config.sys* and setting itself up to activate on each system restart. Using the container method, DCF/2 carves out a chunk of real disk space and creates a virtual disk unit (VDU). The real disk in DCF/2 is referred to as the physical disk unit (PDU). The VDU is given a drive letter (such as *j:*) that is later in the alphabet than the drive letters of real disk drives on your system. DCF/2 allows for a neat trick: Your VDU may be HPFS formatted even on a real FAT drive, which allows you to experiment with the benefits of HPFS while still running the standard DOS FAT file system.

Compression in DCF/2 is achieved by copying or moving files from normal disks to compressed VDUs. Many OS/2 system files cannot reside on DCF/2 compressed disks, so application programs and data files are the obvious choices. Using the Workplace Shell Drives object is the preferred technique, since it will keep your program objects automatically updated. For example, moving program files from normal disk *e:* to VDU *j:* normally requires manual changes since the files no longer reside on drive *e:*, but now reside on drive *j:*. Figure 1 shows the DCF/2 View VDU program as well as the graphical monitor program DCF2MON.

DCF/2 is the compression software with which I personally have the greatest amount of experience. I had it running on my system for almost two years. It is also interesting to note that it is the only software of the three tested that has been permanently deleted from my system. Although a technically sophisticated product, DCF/2 seems to require constant maintenance. The DCF/2 container file (VDU) starts out small and grows dynamically as more and more files are added to the container. On my 400MB real drive, almost 150MB were allocated to the VDU. Many compressed files (hundreds, per-

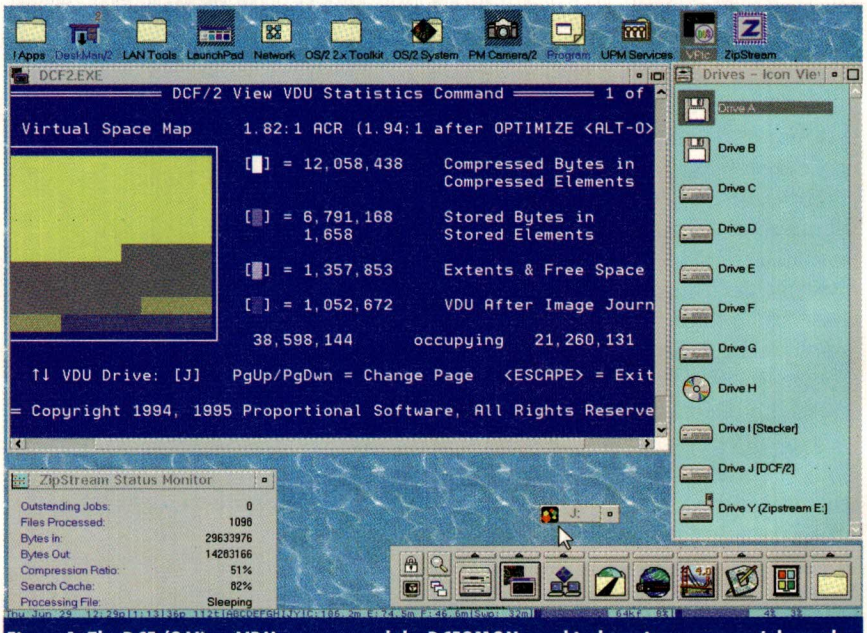
DCF2.EXE
DCF/2 View VDU Statistics Command
Virtual Space Map
1.82:1 ACR (1.94:1 after OPTIMIZE <ALT-O>
[ ] = 12,058,438 Compressed Bytes in Compressed Elements
[ ] = 6,791,168 Stored Bytes in 1,658 Stored Elements
[ ] = 1,357,853 Extents & Free Space
[ ] = 1,052,672 VDU After Image Journ
38,598,144 occupying 21,260,131
↑↓ VDU Drive: [J] PgUp/PgDwn = Change Page <ESCAPE> = Exit
= Copyright 1994, 1995 Proportional Software, All Rights Reserve
ZipStream Status Monitor
Outstanding Jobs: 0
Files Processed: 1098
Bytes In: 29633976
Bytes Out: 14283166
Compression Ratio: 51%
Search Cache: 82%
Processing File: Sleeping
Drives - Icon View
Drive A
Drive B
Drive C
Drive D
Drive E
Drive F
Drive G
Drive H
Drive I [Stacker]
Drive J [DCF/2]
Drive Y (Zipstream E:)

Figure 1: The DCF/2 View VDU program and the DCF2MON graphical monitor program (above the cursor).

haps thousands) depended on the integrity of this very large single container file. Unfortunately, virtual disk units do not automatically shrink in size as files are deleted (true for Stacker also). The 150MB container file mentioned stayed at its bloated size even after 90% of the files were deleted from it. To recover the space, you need to run DCF2PAKR, which will recompress all the files on the VDU and release the unused space. This utility has a potentially serious impact on system availability, since it locks out all other access to the virtual compressed drive. For best results using DCF/2 on an active VDU, it appears that the optimize utility should be run almost hourly.

Benchmark tests showed DCF/2 to be as capable as Stacker and Zipstream in decompression (reading compressed data). However, when compressing (writing), DCF/2 was the worst performer of the three products. DCF/2 compressed the test folders in 380 seconds compared to a copy without compression in 145 seconds yielding a compression "penalty" of 2.62. It took 2.62 times longer than normal to copy and compress the test files to a DCF/2 disk. After copying and compressing, the "compression ratio" of the files on the compressed disk was 1.82:1 (2:1 is generally expected for all products). Only after the optimization program (DCF2PAKR) is run, would the compression ratio be higher (DCF/2 estimated 1.94:1). Although DCF/2 provides the ability to adjust performance, default installed values did not work well on my system. DCF/2 compression hogged system resources so badly that at times I was forced to wait until the copy completed before I was able to switch to another task. Visions of the disruptive Windows hourglass cursor kept popping into my head.

Stacker

Like DCF/2, Stacker is a container-based compression product. Stacker is the most mature product of the three; it has a long reliable legacy as a DOS product. Actually, its history is also the most significant complaint against Stacker: since it is DOS-based, it cannot access HPFS partitions. Installation is fairly easy, but it cannot be run from OS/2. You must actually boot to DOS to get the product installed. Building your compressed disk is also a DOS-only function, as are critical maintenance functions such as CHECK. This lack of HPFS support can cause serious problems in a system with multiple hard drive partitions; disk letters are not consistent between OS/2 and DOS, resulting in possibly disastrous results.

Stacker provides a nice graphical toolbox program where you can see the status of your compressed drive (see Figure 2). Despite the DOS-based limitations (which I believe are severe), the product performs its advertised function flawlessly. Installing on a DOS FAT *c:* 128MB partition with only 15MB free, Stacker was able to compress existing DOS and Windows files to make room for OS/2. Compressed free space was transformed into 130MB, which allowed for OS/2 to be installed in a dual-boot configuration. Stacker is also capable of converting from the popular DOS compression packages: Drivespace, Doublespace and SuperStor/DS.

Stacker provides a neat function called SWAP, which allows for the compressed drive to have the original drive letter. On my test system, the Stacker-compressed drive is *c:*, and the "swapped" original (host) drive is now called *i:*. Although installing OS/2 onto a Stacker-compressed drive is very powerful, it is an exercise not easily accomplished by a beginner. Stacker provides three programs that must be run at the proper time during the OS/2 installation (experienced users should not find this procedure difficult, but it can be confusing for a beginner).

Benchmark tests showed Stacker performance to be between the other products—slower than Zipstream but faster than DCF/2. Stacker compressed the test folders in 465 seconds compared to a copy without compression in 240 seconds, yielding a compression "penalty" of 1.94 (it took 1.94 times

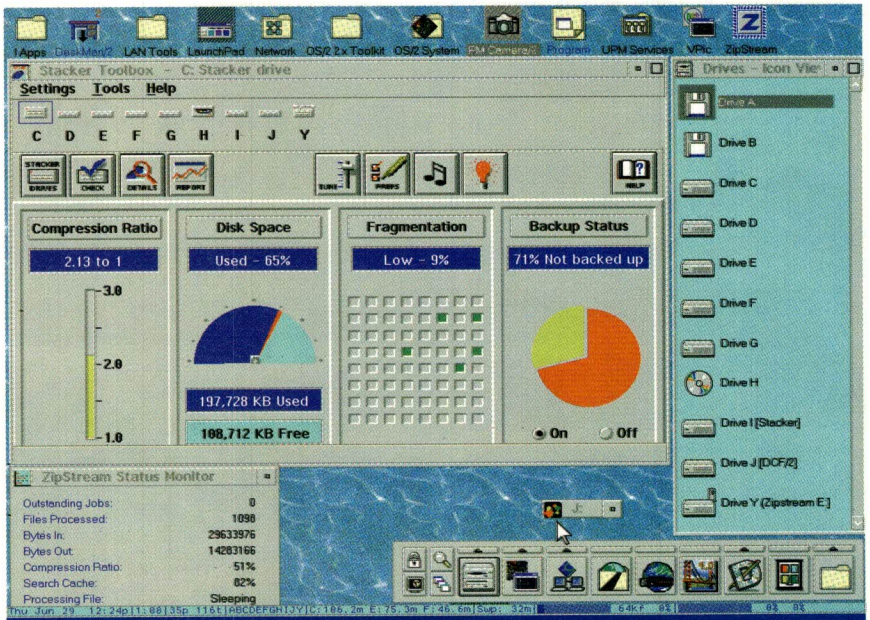

Figure 2: Stacker provides a nice graphical toolbox program where you can see the status of your compressed drive.

longer to copy and compress than just to copy). After copying and compressing, the "compression ratio" of the files on the compressed disk was 1.86:1 (2:1 is expected). The Stacker-compressed disk appeared to be a little more self optimizing than DCF/2; files could be updated and deleted without having to run an optimization program. Notice that Stacker is inherently a slower product in total elapsed time than DCF/2 and Zipstream, because it only works on a FAT-formatted disk. Informal benchmarks revealed that HPFS consistently outperformed FAT. However, overall system performance with Stacker was excellent; compression did not affect the rest of the system in a negative way, as it did with DCF/2.

Zipstream

Zipstream is not container-based, but instead is a file-based (in-situ) compression product. Installation is very easy with updates made to *config.sys* that include an IFS (installable file system) and background compression module. Container files are not used; instead, a "mirror" drive must be set up to access the compressed files. Zipstream is a little disconcerting to get up and running, but safety and performance seem to be much better than DCF/2 and Stacker. Files with Zipstream can be compressed individually using the ZSPACK program, which can be used to compress one or more files by filename mask or can be used to compress an entire directory (folder). Files can also be automatically compressed simply by writing to the mirror drive. To transparently access the compressed files (have them decompressed seamlessly), access to the mirror drive is required. For example, using the ZSATTACH program, I set up virtual drive *y:* to mirror the real drive *e:* (refer to Figure 3). Then, if I need to access a compressed file from *e:* (such as *e:\readme.txt*), I simply refer to it from drive *y:* (*y:\readme.txt*) and decompression will occur transparently. All files, directories, and folders on the real drive (*e:*) are mirrored on the compressed drive (*y:*). I can, therefore, mix compressed and uncompressed files on the same disk. This capability suits me just fine since I can then "phase" in implementation of Zipstream slowly and cautiously.

The real performance power of Zipstream comes when copying files to the compressed virtual drive (*y:*). The files are actually copied to the real drive (*e:*) at normal speed and a low priority background task works on compressing the requested files while you work on other tasks.

Testing revealed the Zipstream method of background compression to be much less disruptive than DCF/2 compression. Since Zipstream is a file-based system, it is inherently safer than the DCF/2 and Stacker container-based type of system. If the container file becomes corrupted, you risk losing the entire compressed disk (VDU), which may contain hundreds or even thousands of files. If the Zipstream compression becomes corrupted or is disrupted, your loss is limited to that single file. A slight amount of retraining is required since files exist on both the uncompressed real disk (*e:*) and the compressed virtual "mirror" disk (*y:*). If you forget and access a compressed file from the real drive, you will see garbage instead of proper data, something like this:

```
__CBSZIPSTREAM__ !@#$%^&*())__+|
```

A good way to work with Zipstream is to always use the compressed drive letter (*y:*) to access the real disk drive (*e:*). Compressed files will be decompressed transparently and uncompressed files will be available as normal.

Benchmark tests showed Zipstream to perform consistently better than Stacker and DCF/2. Zipstream copied the test folders in 200 seconds compared to a normal copy (without Zipstream) in 145 seconds, yielding a compression "penalty" of 1.38 (it took 1.38 times longer to copy and compress than to simply copy). Note, however, that compression in Zipstream is accomplished by a background task that took an additional 140 seconds, but this feature is super. After copying and compressing, the "compression ratio" of the files on the compressed

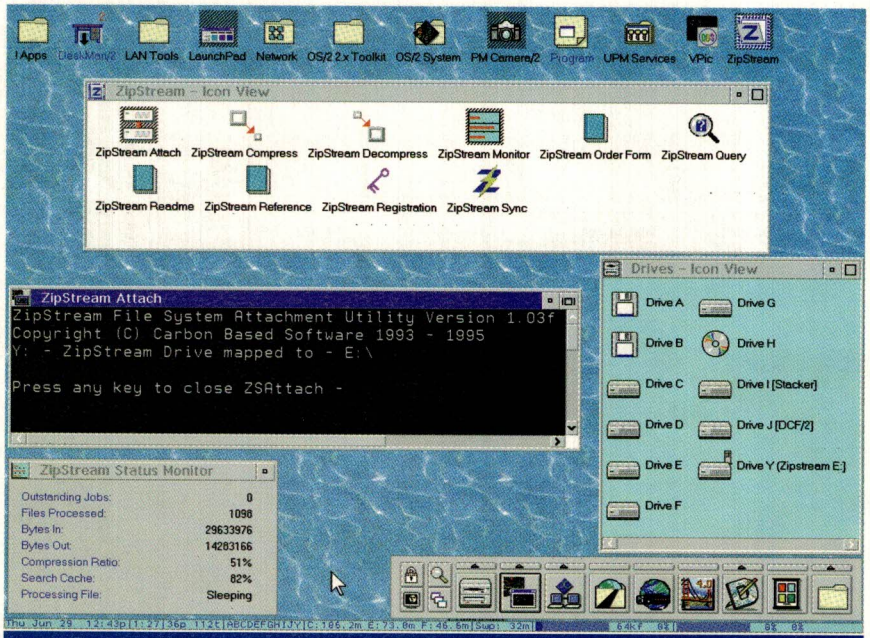

Figure 3: Zipstream using ZSAttach to create compressed drive *y:*, which mirrors the real drive *e:*.

disk was 2.09:1 (expected 2:1). Zipstream performed flawlessly and transparently, even during compression, with no detectable impact on overall system performance.

Bottom Line

Stacker is a well-respected and a mature product that could be great if it supported HPFS. If you can live with the FAT-only restriction or are converting from a DOS-based compression system, Stacker for OS/2 is a natural choice. DCF/2 is the next step up from Stacker, as it allows you to experience the power of HPFS. But DCF/2 is a technically elegant product that fails to deliver since it needs constant attention to work well. Zipstream, the new kid on the block, stole my heart (and checkbook). It is fast, powerful and basically simple to operate. No muss, no fuss. Software like Zipstream is a joy to run.

Disk compression, while not currently used by everyone, may eventually be used by almost everyone who has a hard drive on a computer. Choosing a fast, reliable disk-compression system that is easy to work with is crucial for success. Whether you choose DCF/2, Stacker, or Zipstream, decide with usability and performance in mind. These are important attributes to consider when picking such a critical addition to your system. And, if anyone ever finds a hard drive that is so large that they never run out of free space, please let me know!

Rick Kruer is a computer consultant, college instructor, and a writer. With an extensive background in systems development on large mainframe computers, he is now extending his company, Computer Miracles, to various platforms. Rick can be reached via email at rick@computer-miracles.com.

RESOURCES:

DCF/2 v1.401 ($115)
Development Technologies Inc.
308 Springwood Rd.
Forest Acres, SC 29206-2113
(803) 790-9230
fax (803) 738-0218
email: 76704.34@compuserve.com
READER SERVICE NO. 171

Stacker for OS/2 v4.0 ($99)
Stac Storage & Communications
12636 High Bluff Rd
San Diego, CA 92130
(619) 794-4333
READER SERVICE NO. 172

Zipstream v1.03 ($69)
Carbon Based Software
P.O. Box 912
Runaway Bay
Qld 4216 Australia
email: 100351.2052@compuserve.com
READER SERVICE NO. 173

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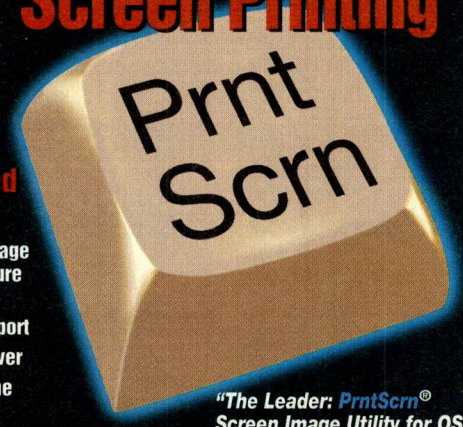

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Review

The American Heritage Dictionary Deluxe Third Edition with Roget's II Thesaurus

Great content, poor presentation. BY GUY WRIGHT

The American Heritage Dictionary and Thesaurus program from DUX Software is a perfect example of a good idea poorly implemented on OS/2 just because no one else had done it yet. It looks like WinWare Corp., developer of the product, licensed the rights to produce an OS/2 version of the American Heritage Dictionary and Thesaurus, had one of their programmers spend a few days building an OS/2 window, and then jammed the dictionary and thesaurus files in afterwards. One gets the opinion that DUX Software, the publisher, spent more time and money designing the box than they did on the program.

It installs easily with options to either copy all the files to your hard disk or let the program run from the CD-ROM (it only takes about 15 MB for all the files). The dictionary features over 200,000 words and the thesaurus contains over 500,000 synonyms, senses, and meanings. Once installed, you can look up words by entering text (including wildcards), browse the dictionary, search for words and word combinations within definitions, find word anagrams, or search for entries in the thesaurus (see Figure 1).

When you launch the program, a single window appears with tabs for the five search types. The window can not be resized—only minimized or closed. This causes problems because not all of the information contained in the definitions will fit in the window they provide. Since the program does not offer horizontal scrollbars or ways to resize the window, you can't always see all the information, as shown in Figure 2. In fact, not even their own prompts fit in their own windows. On the word search window, one option is to search for partial words. The check box warns you that it is "Slowe " (the 'r' is truncated), as shown in Figure 3. The entire program is filled with these little annoyances and minor bugs.

The main dictionary window has space for you to enter words and keeps track of all the words you have looked up during that session. If you misspell a word, it will list alternative spellings in half of the window. The other half of the window is where your dictionary definitions appear. The actual dictionary is fairly comprehensive, providing good middle-level definitions, pronunciations, and etymologies (when available), but the programmers at DUX were a little lax in their special-character filtering and translation. Superscripts and subscripts tend to get squeezed into the lines above and below, and pronunciation characters are barely readable. Beyond these visual formatting problems, apparently the programmer never got around to translating a number of special characters in the dictionary, so many definitions are sprinkled with paragraph marks and odd characters.

You can change the font and font size by right-clicking in the definition area, but the window display is not reformatted for different fonts (or any

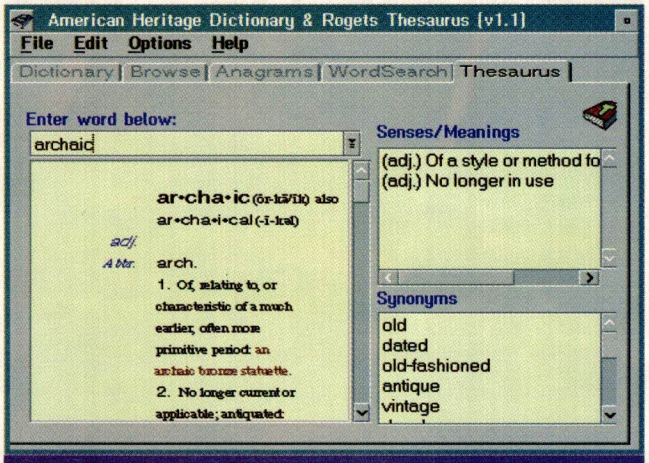
American Heritage Dictionary & Rogets Thesaurus (v1.1)
File Edit Options Help
Dictionary | Browse | Anagrams | WordSearch | Thesaurus
Enter word below:
archaic
Senses/Meanings
(adj.) Of a style or method fo
(adj.) No longer in use
ar•cha•ic (är-kā'ĭk) also ar•cha•i•cal (-ĭ-kəl)
adj.
Abbr. arch.
1. Of, relating to, or characteristic of a much earlier, often more primitive period: an archaic bronze statuette.
2. No longer current or applicable; antiquated:
Synonyms
old
dated
old-fashioned
antique
vintage

Figure 1: The thesaurus screen, showing definitions, senses, and synonyms.

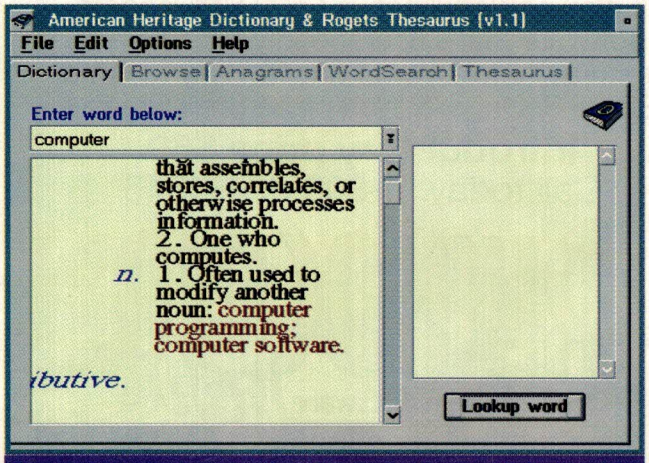
American Heritage Dictionary & Rogets Thesaurus (v1.1)
File Edit Options Help
Dictionary | Browse | Anagrams | WordSearch | Thesaurus
Enter word below:
computer
that assembles, stores, correlates, or otherwise processes information.
2. One who computes.
n. 1. Often used to modify another noun: computer programming; computer software.
ibutive.
Lookup word

Figure 2: The lack of horizontal scrollbars sometimes results in clipped definitions.

particular font that I could discover), so if you pick too large a point size, the words will overlap in the definition window, making it impossible to read (see Figure 4). For some curious reason, the font requester window is very erratic. Half the time it will default to eight-point Courier boldface, and the other half of the time it simply ignores your settings. You will also have to change the font settings for each of the five modules because the program doesn't carry the font settings from the dictionary over to the thesaurus or the word search. It is also apparent that the programmer simply reused an old font requester routine that had been lying around, because it has an option to set the font for either screen or printer even though "printer" is permanently grayed out (the program doesn't have a print option).

In addition to your typical word definitions, occasionally you will see an entry for a root word. This fragment contains etymological information about the root. One of the options (well, actually, it is the only option) is to link the dictionary to the thesaurus when looking up words. When you flip back and forth between them, the same word will be automatically looked up, although not all of the words in the dictionary are listed in the thesaurus. Unfortunately, the linking doesn't hold between the browse or word search screens. If you don't link the dictionary and the thesaurus, you must copy the selected word to the clipboard, switch to the other module, and paste from the clipboard (these are the only two edit options available). Unfortunately, you can't cut and paste from the browse or word search modules. If you find a word with more than one meaning in the dictionary section, then switch to the thesaurus, it won't be able to find any of the meanings (because, while the dictionary contains a word "top" with two definitions, the thesaurus doesn't recognize the words "top [1]" or "top [2]"). If you manually enter the word "top" you will only get synonyms for the first definition. Root fragments will also appear in the thesaurus window, although you can't look them up.

All of the windows are painfully slow to scroll through (especially if the window has a lot of information). DUX admits this in the readme file and claims that they are working on speeding it up. In some cases, it is merely annoying but, in other cases, it is downright frustrating. For example, in the Browse module you have a traditional scroll bar along the side of the window. Scroll bars work well in most situations but, when you have 200,000 entries in the list, navigation is almost impossible. Although you can type the first letter to jump into the list, it would be better to put letter tabs along the side to allow users to jump directly to a letter and scroll from there.

You might think that a dictionary and thesaurus would be helpful when word processing. However, the only way to integrate the dictionary into a word processing session is to copy your search word to the clipboard, switch to the dictionary application, then paste the word from the clipboard into the dictionary. Once you have found the right word, you must copy it to the clipboard, switch back to the word processor, and paste the word in. OK, it's multitasking, but hardly integrated.

Overall, the program has a lot of good information (dictionaries and thesauri usually do have a lot of good information). Unfortunately, it is rendered nearly unusable by a sloppy design and poor programming. Go buy a good dictionary and thesaurus, and save yourself some money and frustration.

Guy Wright is the Executive Editor of OS/2 Magazine.

RESOURCE:

American Heritage Dictionary and Roget's II Thesaurus v. 1.1 ($69.95)
DUX Software Corp.
425 Sherman Ave., Ste. 330
Palo Alto, CA 94022
(415) 473-1800
(415) 462-8723
E-Mail: sales@dux.com
READER SERVICE NO. 174

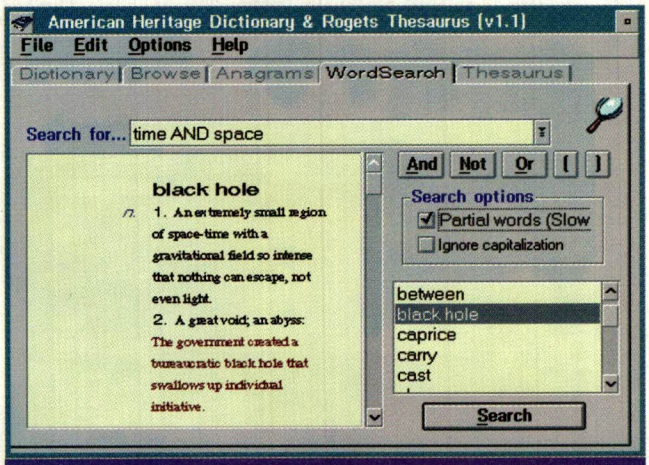
American Heritage Dictionary & Rogets Thesaurus (v1.1)
File Edit Options Help
Dictionary Browse Anagrams WordSearch Thesaurus
Search for... time AND space
black hole
n. 1. An extremely small region of space-time with a gravitational field so intense that nothing can escape, not even light.
2. A great void; an abyss: The government created a bureaucratic black hole that swallows up individual initiative.
And Not Or [ ]
Search options
Partial words (Slow
Ignore capitalization
between
black hole
caprice
carry
cast
Search

Figure 3: Even the prompts get clipped. Note: "(slow" should be "slower."

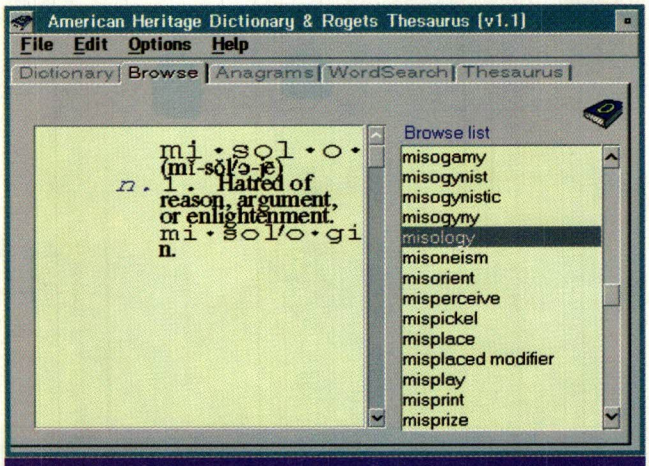

Figure 4: Resizing fonts can result in overlapping text.

Power to the People

Tripplite's Power Alert Plus and APC's PowerChute Plus. BY ESTHER SCHINDLER

In any given OS/2 computer system, there's a lot going on. Even when the system is ostensibly idle, dozens of threads are active. OS/2 delays writing to the hard disk to maximize system responsiveness. When you consider how many tasks are active when you work on several things at once—behavior that OS/2 encourages—it isn't surprising that the operating system gets cranky if you don't shut down properly.

You can do many things to maximize your system up-time. However, you have little control over the electric company. If the power goes out, your system is off. Unless, of course, you have an uninterruptible power supply (UPS), which can buy you the time to close your files and shut down gracefully.

Several companies that manufacture UPSs sell extra-cost utilities that monitor what the UPS is doing, and—if the power does go out—can be instructed to perform a system shutdown. These utilities are usually marketed to network administrators to keep a server running, but at their comparatively low cost they may be of interest to other OS/2 users. It's terrible to have a server go down, but it's nearly as distressing to leave your databases in an ambiguous condition or to be bytes away from completion of a 3MB download.

I looked at two of the OS/2 utilities available, Tripplite's Power Alert Plus and APC's PowerChute Plus. No attempt was made to do an exhaustive comparison of every such package (there isn't all that much to say about them). Rather, this article is an introduction to what these kind of utilities can do for you, in addition to reporting how well Tripplite's and APC's products deliver on their promises. I also focus no attention on the general behavior of the UPS hardware, as the specific model you choose will depend on the draw of your own equipment.

Power to the people

Both software packages require that you connect that manufacturer's UPS to a serial port on your computer. You install the software, then choose the defaults you want to use. You have quite a few options here, from the length of time between a power outage and system shutdown, to the nature of the notification that the monitoring software should give the software. Both programs work with LAN Server, Banyan, or Netware, though I tested the software on a stand-alone system.

Installing Power Alert Plus (using a Tripplite 750VA LAN UPS) was a straightforward process; I was using the program only a few minutes after typing **A:INSTALL**. On the other hand, PowerChute's installation (with an APC Smart-UPS) was a continuing source of grief. The installation program never did work with OS/2 2.11 (reminding me that the only more ominous person from whom to hear, "I never saw one like that before" than a technical support representative is one's doctor). The installation program worked correctly in Warp, but it set its *.ini* files to look at the *c:* drive instead of the *d:* drive, where I'd locat-

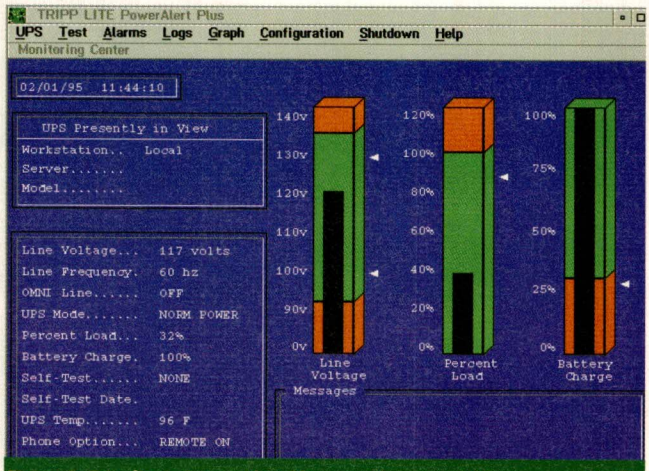

Figure 1: Tripplite's PowerAlert Plus provides a readable screen with all the relevant UPS info.

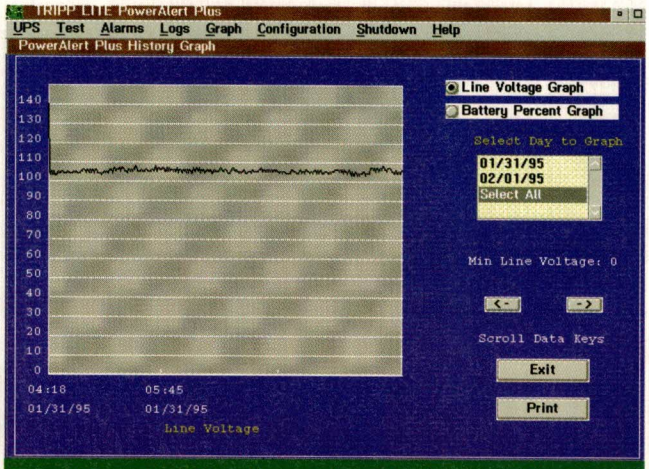

Figure 2: PowerAlert Plus will graph the UPS and power performance statistics.

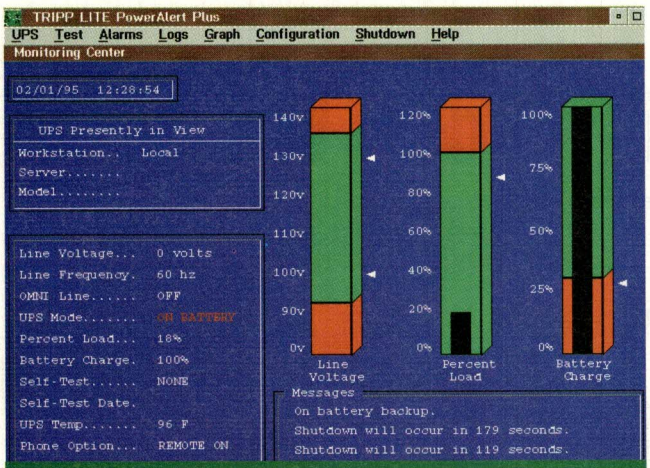

Figure 3: When the power does go out, Tripplite's PowerAlert Plus keeps you updated on how much time is left before shutdown.

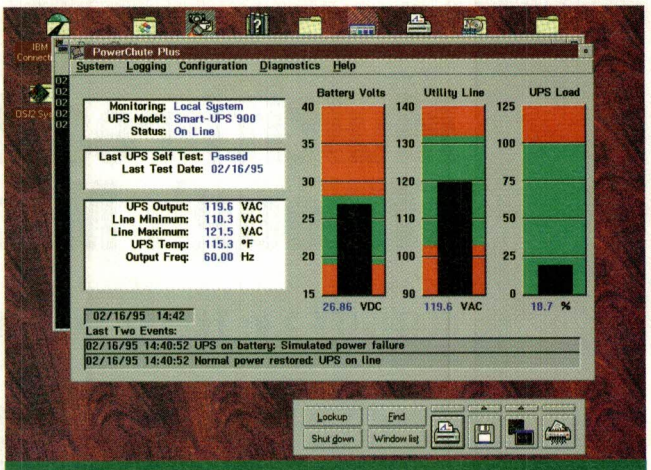

Figure 4: APC's PowerChute keeps you updated with the current power status.

ed the files. This little problem gave me the opportunity to learn that APC's tech support staff is friendly and toll-free, but I'd rather not have to call them.

PowerChute made a bigger impact on my system than Power Alert. PowerChute changed my *config.sys* file, and added statements to *startup .cmd,* which begins a detached session that has to be running for PowerChute to work.

The programs provided roughly equal amounts of information about the system. Both showed a graph of power usage and line voltage, as well as other information that the UPS provides, such as ambient temperature. Both kept a log of power "events" (such as a power outage) and statistics about the system. Power Alert graphed a few of those logs, which was a nice touch.

I simulated a power outage by the expedient method of pulling the plug on the UPS. As expected, after the period of time I'd specified in the application's settings, the power management program initiated an OS/2 shutdown. Had I been running the software on a LAN, the application would also have notified the users before shutting down the network software.

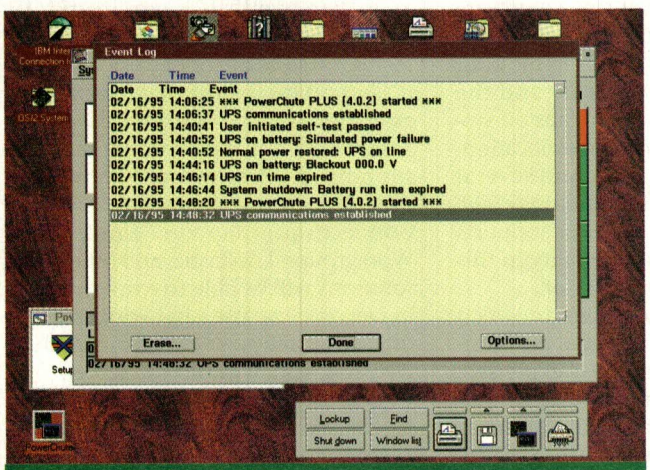
Event Log
Date Time Event
02/16/95 14:06:25 *** PowerChute PLUS (4.0.2) started ***
02/16/95 14:06:37 UPS communications established
02/16/95 14:40:41 User initiated self-test passed
02/16/95 14:40:52 UPS on battery: Simulated power failure
02/16/95 14:40:52 Normal power restored: UPS on line
02/16/95 14:44:16 UPS on battery: Blackout 000.0 V
02/16/95 14:46:14 UPS run time expired
02/16/95 14:46:44 System shutdown: Battery run time expired
02/16/95 14:48:20 *** PowerChute PLUS (4.0.2) started ***
02/16/95 14:48:32 UPS communications established
Erase...
Done
Options...
Lockup
Find
Shut down
Window list

Figure 5: You can always check the power logs to examine what's happened.

Summary

I liked Tripplite's PowerAlert much better than APC's PowerChute but, in the real world, you'll be stuck with the application that was written to work with your particular UPS. Despite my grumbles, PowerChute did work acceptably once I got past the initial installation annoyances.

In any case, I liked having the extra insurance of knowing that my computer would keep running even if the power went out, and that it would shut down gracefully if the power outage continued. I believe you'd enjoy that feeling, too.

Esther Schindler is a computer consultant and writer. She is a contributing editor to OS/2 Magazine, the sysop of the Ziffnet Executives On-line Forum on CompuServe, and coauthor of Teach Yourself Rexx in 21 Days, from Sams Publishing. You can contact her at 72241.1417 @compuserve.com.

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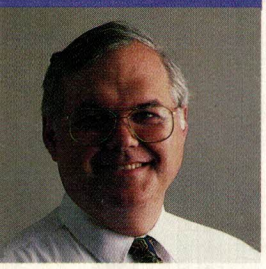


Multithreading Your Way Through Management

NETFINITY 3.0: THEORY AND EXECUTION

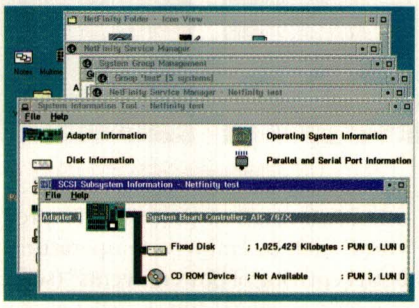
BY WAYNE RASH, JR.

The demonstration at PC Expo was terribly exciting. Michael Coleman, general manager of the IBM PC Server division, explained the company's new management software that promises to deliver capabilities that most network managers would die for. Around me, a collection of computers of different types yielded their secrets to an OS/2-based console, accepted commands, and echoed their screens to the manager. The software clearly looked incredibly cool. Which is, of course, what makes demoware so much fun.

In this case, cool made sense. IBM's new management product, NetFinity, makes full use of OS/2's capabilities to produce a network management console that can monitor the actions of workstations and servers anywhere on the network. In fact, the package's client side can be set to alert the NetFinity console before any number of potential problem events occur. And, because the console is OS/2-based, its multithreaded design makes such wide-ranging monitoring natural.

In fact, NetFinity supports several client platforms, as well as both Windows and OS/2 as management platforms. The difference is that the OS/2 version of the manager is designed to have some significant added functionality, because of OS/2's capabilities. Clients include OS/2 and Windows, in addition to Novell NetWare and LAN Server.

NetFinity and OS/2 are designed to work well together. OS/2's ability to handle multiple processes and threads means that an OS/2-based management console is less likely to be overwhelmed by large management tasks


NetFinity Folder - Icon View
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Group "test" [5 systems]
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File Help
Adapter Information
Operating System Information
Disk Information
Parallel and Serial Port Information
SCSI Subsystem Information - Netfinity test
File Help
Adapter 1
System Board Controller: AIC-7873
Fixed Disk ; 1,025,429 Kilobytes : PUN 0, LUN 0
CD ROM Device ; Not Available : PUN 3, LUN 0

than the more primitive multitasking that is supported by Windows. In fact, NetFinity is designed to handle networks of significant size with a combination of diverse workstations and network servers.

How it works

NetFinity is an application that contains a number of smaller applications. The functions include a System Information utility that performs a hardware inventory of the computer on which it's installed. It includes a system monitor that lets both the local user and the remote administrator keep tabs on system resource usage, memory allocation, disk space, CPU activity, and several other potentially critical functions. The OS/2 version of the monitor supports significantly more functionality in this area than the Windows version.

Depending on the system in which it's installed, NetFinity might also contain a redundant array of inexpensive disks (RAID) Manager, a NetWare Services Manager Launch utility (for running NetFinity from within netware management services—NMS), and a desktop management interface. Management stations include a remote system manager that allows other systems that are running the client services software to remotely manage across the network or through a dial-up connection.

NetFinity can take advantage of OS/2's capabilities to allow its manager to provide detailed information on installed SCSI controllers, network adapters, and uninterruptable power supplies. It will even monitor the actions of your Pentium processor, if you have one, and will note whether your Pentium is bug-free or not. An important feature is that any monitored event can be associated with an alert level, so that such diverse items as insufficient disk space or even the running of specific software can generate an alert to the manager. Companies could even monitor corporate Doom sessions.

OS/2 and communications monitoring

OS/2 comes from IBM with support for TCP/IP, Novell's IPX, and NetBIOS. NetFinity can support any of these protocols individually or in combinations. It's important to note that it is not necessary for a file server to be available on a network, but the protocol must be supported. Peer-to-peer networks, including those that use OS/2 Warp Connect's peer support, Windows for Workgroups, LANtastic, and other such solutions will be able to work just fine. In fact, you can use a network protocol that's normally server-centric, such as IPX, and work without the server.

Because the NetFinity management software will work without the management workstation having to be attached to the server, you can monitor events on a network file server, even if people are not using the server at the time. Under some circumstances, this

software could be an important diagnostic tool.

If only it worked

We decided to look at NetFinity 3.0 as a platform, because we wanted to see how well OS/2-based software would manage a network. NetFinity Manager was installed on a Digital Equipment Company PCxl 590 workstation that was running a commercial version of OS/2 Warp Connect. This workstation used an Intel EtherExpress Pro 100 network card, an Adaptec 2940 SCSI controller, 32MB RAM, a 1GB SCSI hard disk, and a CD-ROM drive.

The NetFinity Services software was installed on a Gateway 2000 66 MHz 486 EISA machine running MS-DOS 6.2 and Windows for Workgroups 3.11, a Northgate 66 MHz 486 ISA/VESA machine running OS/2 2.1, and a DEC Prioris HX 590 file server running Novell NetWare 4.1. All three machines had 32MB RAM and 1GB hard disks. The DEC server was equipped with an Intel EtherExpress Pro 100 network adapter as well as an EtherExpress 32 network adapter. The Gateway was using an EISA version of the EtherExpress Pro 100, while the Northgate was equipped with an EtherExpress 16 ISA card. All systems were connected to a category 5 network with Grand Junction hubs.

Despite having plenty of resources available for each environment in which it was asked to function, NetFinity failed to work properly in any of them. In fact, during our tests NetFinity managed to bring the entire network down by locking up the NetWare file server.

The failure modes varied. The NetFinity Manager worked fine until it was asked to monitor the Novell server. At that point, the Manager crashed and delivered a register listing. The crash apparently locked up the server, which required that we perform a hardware reset (something you'd normally avoid). We also lost access to other network resources, even from workstations that weren't involved in the tests.

In local mode, NetFinity worked fine on the DEC workstation running Warp. It correctly identified installed components, showed status accurately, allowed us to set alarms, and so on. It was only the attempt to monitor the file server remotely that killed it.

The Gateway and the Northgate didn't need the network to fail with NetFinity. On the Northgate (running OS/2), NetFinity failed to even find the network, despite the fact that the workstation was logged into the Novell server at the time.

The Gateway had a harder time. While NetFinity was able to find the network, it was unable to find system status without unfortunate problems. Its attempt to check the EISA bus, for example, resulted in a general protection fault under Windows, which then took NetFinity down with it. Its attempts to look at the ATI Graphics Pro EISA video card resulted in turning everything on the screen either pink or green, with red highlights. It didn't matter which video mode the card was using.

Management error

Clearly, despite the fact that managing networks with OS/2 is a good idea, perhaps IBM's approach to the problem leaves something to be desired. The demonstration worked fine (demonstrations nearly always do, even with products that function under no other circumstances). While it might be a bit harsh to suggest that NetFinity won't work at all, since it clearly does work at least part of the time, it's also clear that this product probably will not be the OS/2 killer app for network management. In fact, the level of the software's quality coupled with the problems that come with other IBM software products (such as OS/2 Warp's legendary installation program), makes one wonder if OS/2 will have the chance to be the enterprise network management platform of choice.

The sad part of this story is that OS/2 is so well suited for an enterprise management role. It's got everything: flexibility, power, scalability, security, and stability. It's all you could ask for in a platform—provided, of course, it isn't killed first on the quality issue.

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The Ins and Outs of REXX

INPUT/OUTPUT INSTRUCTIONS AND FUNCTIONS.

BY DICK GORAN

I/O in REXX is really a very simple matter, yet it seems confusing to both programming rookies and programming veterans. Newcomers aren't sure how to get started and programmers who are familiar with other languages are confused by the relative simplicity of I/O in REXX. Table 1 contains a list of the I/O-related instructions and functions in OS/2 SAA REXX (functions are indicated by the paired parenthesis following the name). Included are: character-related functions (CHAR), line-related functions (LINE), screen-related functions (Sys...), REXX external data-queue functions (QUEUED), and one that is unique to the OS/2 Presentation Manager environment (RxMessageBox).The **SAY** instruction writes output to the screen while the **PULL**, **PUSH**, and **QUEUE** instructions work with REXX external data queues. The character, line, and queue functions are similar in purpose. **CHARS()**, **LINES()** and **QUEUED()** are each used to determine if data exists in the respective file or queue. The **SysFileDelete()** function is not exactly an I/O function, but I have included it in the table because, if a file exists, REXX output will be appended to the file. The **SysFileDelete()** function should be called first to erase any existing file when a new file is to be created.

The PC file system, independent of FAT or HPFS, is a character-based file system, rather than a record-based file system, as is found in the IBM mainframe environment. This factor is important to remember when using **CHARS()** versus **LINES()**. On a character-based file system, the **CHARS()** function will return the number of characters that remain on the input source, whereas the **LINES()** function will only return a Boolean value of 0 or 1 (false or true), indicating the absence or presence of remaining data. On the other hand, the use of these functions is reversed on a record-based file system. **CHARS()** will only return a Boolean value of 0 or 1, indicating the absence or presence of data, whereas **LINES()** will return the actual number of records remaining on

Listing 1: Parse Libpath from *config.sys*.

```
/* 9510LS01.CMD - Parse Libpath from CONFIG.SYS */                    /* 01 */
                                                                      /* 02 */
crlf                  = '0D0A'x /* carriage return / line feed */    /* 03 */
libpath_search_arg    = crlf || 'LIBPATH='                            /* 04 */
                                                                      /* 05 */
/*-------------------------------------*\                            /* 06 */
|  Determine CONFIG.SYS location & size  |                           /* 07 */
\*-------------------------------------*/                            /* 08 */
config_sys_file =,                                                    /* 09 */
   LEFT( VALUE( 'RUNWORKPLACE',, 'OS2ENVIRONMENT' ), 2 ) ||,          /* 10 */
   '\CONFIG.SYS'                                                      /* 11 */
config_sys_size =,                                                    /* 12 */
   STREAM( config_sys_file, 'C', 'QUERY SIZE' )                       /* 13 */
if config_sys_size = '' then                                          /* 14 */
   do                                                                 /* 15 */
      say 'Unable to locate' config_sys_file                          /* 16 */
      exit                                                            /* 17 */
   end                                                                /* 18 */
                                                                      /* 19 */
/*-----------------------------*\                                    /* 20 */
|  Read entire file & close it  |                                    /* 21 */
\*-----------------------------*/                                    /* 22 */
config_sys_area =,                                                    /* 23 */
   CHARIN( config_sys_file, 1, config_sys_size )                      /* 24 */
call STREAM config_sys_file, 'C', 'CLOSE'                             /* 25 */
uppercase_config_sys_area =,                                          /* 26 */
   TRANSLATE( config_sys_area )     /* uppercase for searching */     /* 27 */
                                                                      /* 28 */
/*-------------------------------------*\                            /* 29 */
|  Find LIBPATH= at beginning of line  |                            /* 30 */
\*-------------------------------------*/                            /* 31 */
```

the input source. REXX data queues are always line oriented with the **QUEUED()** function returning the number of lines remaining in the REXX external data queue.

Characters versus Lines

The only difference between the character and line input and output functions is the absence or presence of an end-of-line designator. With both DOS and OS/2, the end-of-line designator defaults to a carriage return/line feed pair ('0D0A'x). Other platforms differ and in some cases simply use a line feed ('0A'x) to indicate the end of a line.

The **LINEIN()** function in OS/2 REXX will accept the cr/lf pair or either character independently to indicate the end of a line and return the data from the current position in the input stream (file) up to, but not including, the end-of-line designator (which is always transparent to the function). **CHARIN()**, on the other hand, returns the number of characters specified or to the end of the input stream, whichever is less. No restriction is placed on the contents of the data that is retrieved with the **CHARIN()** function. **LINEIN()** simply parses the data and returns it, one line at a time, with the end-of-line designator removed, whereas **CHARIN()** returns a specified number of characters.

Similarly, the **CHAROUT()** function writes a specified number of characters to the output stream and the **LINEOUT()** function writes a specified number of characters to the output stream and appends the carriage return/line feed pair following the specified data. For example, the following line:

```
call LINEOUT file_name, '1'
```

will cause three characters to be written to the file, which would include the character **1** followed by a carriage return/line feed pair. If the **CHAROUT()** function is used in place of the **LINEOUT()** function, only the character **1** is written to the file.

In some cases, it is more efficient to read an entire file into storage and parse it for a particular value than to read the file line-by-line looking for a certain line or lines. Listing 1 contains such a program. The program *9510ls01.cmd* reads the *config.sys* file, parses it for the **LIBPATH=** line, and writes the tokens of the **LIBPATH=** line to the screen. The programs that are listed in this column are available to be downloaded

```
libpath_beg_pos =,                                          /* 32 */
   POS( libpath_search_arg, uppercase_config_sys_area ) + 2 /* 33 */
if libpath_beg_pos = 2 then                                 /* 34 */
   do                                                       /* 35 */
      say 'Unable to locate LIBPATH='                       /* 36 */
      exit                                                  /* 37 */
   end                                                      /* 38 */
libpath_end_pos =,                                          /* 39 */
   POS( crlf, uppercase_config_sys_area, libpath_beg_pos )  /* 40 */
libpath_string =,                                           /* 41 */
   SUBSTR( config_sys_area,,                                /* 42 */
      libpath_beg_pos,,/* 43 */
   libpath_end_pos - libpath_beg_pos )                      /* 44 */
                                                            /* 45 */
/*------------------------*\                                /* 46 */
|  Write tokens to screen  |                                /* 47 */
\*------------------------*/                                /* 48 */
token_number = 0                                            /* 49 */
do while libpath_string <> ''                               /* 50 */
   parse value libpath_string with,                         /* 51 */
      token,                                                /* 52 */
      ';',                                                  /* 53 */
      libpath_string    /* 54 */
   token_number = token_number + 1                          /* 55 */
   if token_number = 1 then                                 /* 56 */
   do                                                       /* 57 */
       say token || ';'/* 58 */
   end                                                      /* 59 */
   else                                                     /* 60 */
      do                                                    /* 61 */
        say COPIES( ' ', 8 ) || token || ';'                /* 62 */
      end                                                   /* 63 */
end                                                         /* 64 */
exit                                                        /* 65 */
```

Table 1: REXX I/O Instructions and functions

SAY

CHARS()
CHARIN()
CHAROUT()

LINES()
LINEIN()
LINEOUT()
QUEUED()
PULL
PUSH
QUEUE

RxMessageBox()

STREAM()

SysFileDelete

SysCls()
SysCurPos()
SysCurState()
SysGetKey()
SysTextScreenRead()
SysTextScreenSize()

from the OS2AVEN forum on CompuServe in Library 2 or can be ftped from <*ftp://ftp.cfsrexx.com/pub/*>. I have appended sequence numbers to the source programs in this column for easy reference.

Line 04 is the search argument that is used to find the **LIBPATH=** statement in the file area. It is preceded by a carriage return/line feed pair to assure that **LIBPATH=** begins in the first position of the line. Otherwise, if **LIBPATH=** occurred in a comment, it would satisfy the search criteria. Line 10 contains a function within a function—a technique that I usually discourage. However, in this instance, its use is warranted. The combined functions assign the drive letter and colon of the boot drive to the beginning of the string *config_sys_file*. Lines 23 to 27 read the entire *config.sys* file, close the file, and copy the contents of the file to a hold area while translating the data to uppercase. This technique provides a simple method for attaining case-insensitively while searching the data. The actual string will be extracted from the untranslated area so that case is preserved for displaying the tokens within the **LIBPATH=** line.

Console/screen output

Typically, screen output is produced with the **SAY** keyword instruction. However, the **CHAROUT()** and **LINEOUT()** functions can also be used to write data to the screen. Omitting the first parameter (file name) from a call or function invocation to either function causes the **STDOUT** file handle to be selected. **STDOUT**, a name that is reserved by the operating system, stands for the standard output device. Also, a file name of 'CON:' can be specified as the file name parameter. Use of 'CON:' is subtly different from allowing the data to go to **STDOUT**, because **STDOUT** can be redirected and 'CON:' is the same as using a user-selected file name. Listing 2 contains a program that writes a bright white on cyan string on the screen and then creates the illusion of a spinning cursor at the end of the colored line for ten seconds. It is important to note that if you use a file name of 'CON:' , it uses a file handle similar to any other file and, therefore, the file must be closed to release the resource.

It is not necessary to explicitly open a file in REXX, as long as an implied open in both read and write mode is acceptable.

Opening and closing files

The least understood part of REXX I/O is most likely the opening and closing of files. It is not necessary to explicitly open a file in REXX, as long as an implied open in both read and write mode is acceptable. That's exactly what happens when a file is referenced with **CHARIN()** or **LINEIN()**. **CHAROUT()** and **LINEOUT()** obviously have an implied write mode open.

Files can be closed with a call to either **CHAROUT()** or **LINEOUT()** with just a single parameter of the file name. However, I prefer not to call **LINEOUT()** for an input file. I therefore strongly recommend that the **STREAM()** function be used to close a file. Closing a file, either input or output, releases an operating system resource, which is known as a file handle. Because only a finite number of file handles are available (15 that are useable at the present time), you should always remember to close a file after referencing it. If you must have more than 15 files open simultaneously, **REXXLIB** from Quercus Systems contains the **DOSFILEHANDLES()** function to increase the number of handles that are available to a given session. In addition, the new **REXXUTIL** module, which is anticipated from

Listing 2: Description here.

```
/* 9510LS02.CMD - Color & spinning character */                          /* 01 */
                                                                         /* 02 */
/*--------------------*\                                                /* 03 */
|  Register REXXUTIL  |                                                 /* 04 */
\*--------------------*/                                                /* 05 */
call RxFuncAdd 'SysLoadFuncs', 'REXXUTIL', 'SysLoadFuncs'               /* 06 */
call SysLoadFuncs                                                       /* 07 */
                                                                        /* 08 */
/*-----------*\                                                         /* 09 */
|  Constants  |                                                         /* 10 */
\*-----------*/                                                         /* 11 */
bksp                  = '08'x                                           /* 12 */
crlf                  = '0D0A'x                                         /* 13 */
progress_list         = ' \|/'  /* 'C45C7C2F'x */                       /* 14 */
progress_subscript = 1                                                  /* 15 */
white_on_cyan         = '1B'x || '[1;37;45m' /* bright white on cyan   */
ansi_off              = '1B'x || '[0m'       /* reset to normal        */
                                                                        /* 18 */
/*---------------------------------*\                                   /* 19 */
|  Write string and turn off cursor  |                                  /* 20 */
\*---------------------------------*/                                   /* 21 */
output_string =,                                                        /* 22 */
   COPIES( ' ', 25 )          ||,                                       /* 23 */
   white_on_cyan              ||,                                       /* 24 */
   'Watch the spinner!   '    ||,                                       /* 25 */
   ansi_off                                                             /* 26 */
```

IBM, that I detailed in last month's column (September 1995, p. 57) will provide the ability to increase or to explicitly set the number of file handles per session.

The **STREAM()** function can also be used to position the read/write pointer to a file as well as permit information about a specific file to be retrieved. Information available with the **STREAM()** function includes: the file's existence ('QUERY EXISTS'), size ('QUERY SIZE'), and date and time stamp ('QUERY DATETIME').

Queue I/O

In my January column (p. 55), I covered the subject of REXX external data queues. In this month's column, I am only discussing data queues and their relationship to I/O. Lines can be placed in a REXX data queue with the keyword instructions **PUSH** and **QUEUE**. The former inserts data for first-in first-out (FIFO) retrieval and the latter inserts data for last-in first-out (LIFO) retrieval. Data can also be redirected or piped to a queue with the inappropriately named RxQueue subcommand (not to be confused with the **RXQUEUE()** function). For example:

```
dir | RxQueue
```

will cause the output of the **dir** command to be stored in the REXX data queue. The data could be extracted from the queue with the sequence as follows:

```
do while QUEUED() > 0
    pull input_
    say input_line
end
```

Note that the special file name, **QUEUE**, is used in this example. If both the **STDOUT** and **STDERR** output is to be piped, the following notation would be used:

```
dir | 2>&1 | RxQueue
```

STDERR would receive the error message that indicates that no files are available to be displayed (SYS0002: The system cannot find the file specified).

RxMessageBox function

RxMessageBox() is a unique built-in function that is found only in OS/2 REXX. It provides a graphical-user-interface (GUI) method of simulating a command-line interface on the OS/2 Desktop. It can only be used in REXX programs that are run in Presentation Manager (PM) mode. To satisfy this requirement, IBM provided the PMREXX program. Details of the **RxMessageBox()** function can be found in the *rexx.inf* file. One of the major drawbacks to using PMREXX for regular programming is that it always pops up a dialog box, which states that "The REXX procedure has ended" when the user program completes. This foolish message is hard-coded into PMREXX and, unfortunately, you can't get around it.

REXXUTIL I/O functions

REXXUTIL contains the I/O functions in Table 1 that begin with "Sys." All are screen-related, reasonably self-explanatory, and included in the *rexx.inf* documentation. The program in Listing 2 uses the **SysCurState()** function to turn the cursor off and then back on.

```
call CHAROUT 'CON:', output_string                                  /* 27 */
call SysCurState 'OFF'                                              /* 28 */
                                                                    /* 29 */
/*------------------------------*\                                  /* 30 */
|  Loop writing spin characters  |                                  /* 31 */
\*------------------------------*/                                  /* 32 */
call TIME 'E'              /* reset elapsed timer */                /* 33 */
do until TIME( 'E' ) > 10   /* run for n seconds  */                 /* 34 */
   call CHAROUT 'CON:', bksp ||,                                    /* 35 */
                        SUBSTR( progress_list,,                     /* 36 */
                           progress_subscript,,                     /* 37 */
                           1 )                                      /* 38 */
   progress_subscript = progress_subscript + 1                      /* 39 */
   if progress_subscript > LENGTH( progress_list ) then             /* 40 */
       do                                                           /* 41 */
           progress_subscript = 1                                   /* 42 */
   end                                                              /* 43 */
end                                                                 /* 44 */
                                                                    /* 45 */
/*----------------------------------*\                             /* 46 */
|  Close CON to release file handle  |                             /* 47 */
\*----------------------------------*/                             /* 48 */
call LINEOUT 'CON:', bksp || ' '  /* clear spinner character */      /* 49 */
call STREAM 'CON:', 'C', 'CLOSE'                                    /* 50 */
call SysCurState 'ON'   /* turn cursor back on */                   /* 51 */
exit                                                                /* 52 */
```

RESOURCES:

REXXLIB ($50.00)
Quercus Systems
P.O. Box 2157
Saratoga, CA 95070
(408) 867-7399
Fax: (408) 867-7489
BBS: (408) 867-7488
CIS, PCVENA, Sec 11 (Charles Daney 75300,2450)
READER SERVICE NO. 177

Dick Goran is the author of the REXX Reference Summary Handbook, Third Edition. He has been in the computer industry since 1961 and was in the IBM mainframe systems software development business until 1987. He teaches OS/2 REXX to corporate clients and lectures on OS/2. His free REXX utility programs can be downloaded from OS2DF1, lib 6 on CompuServe or ftped from ftp.cfsrexx.com /pub. He can be reached via e-mail at 71154.2002@compuserve.com.

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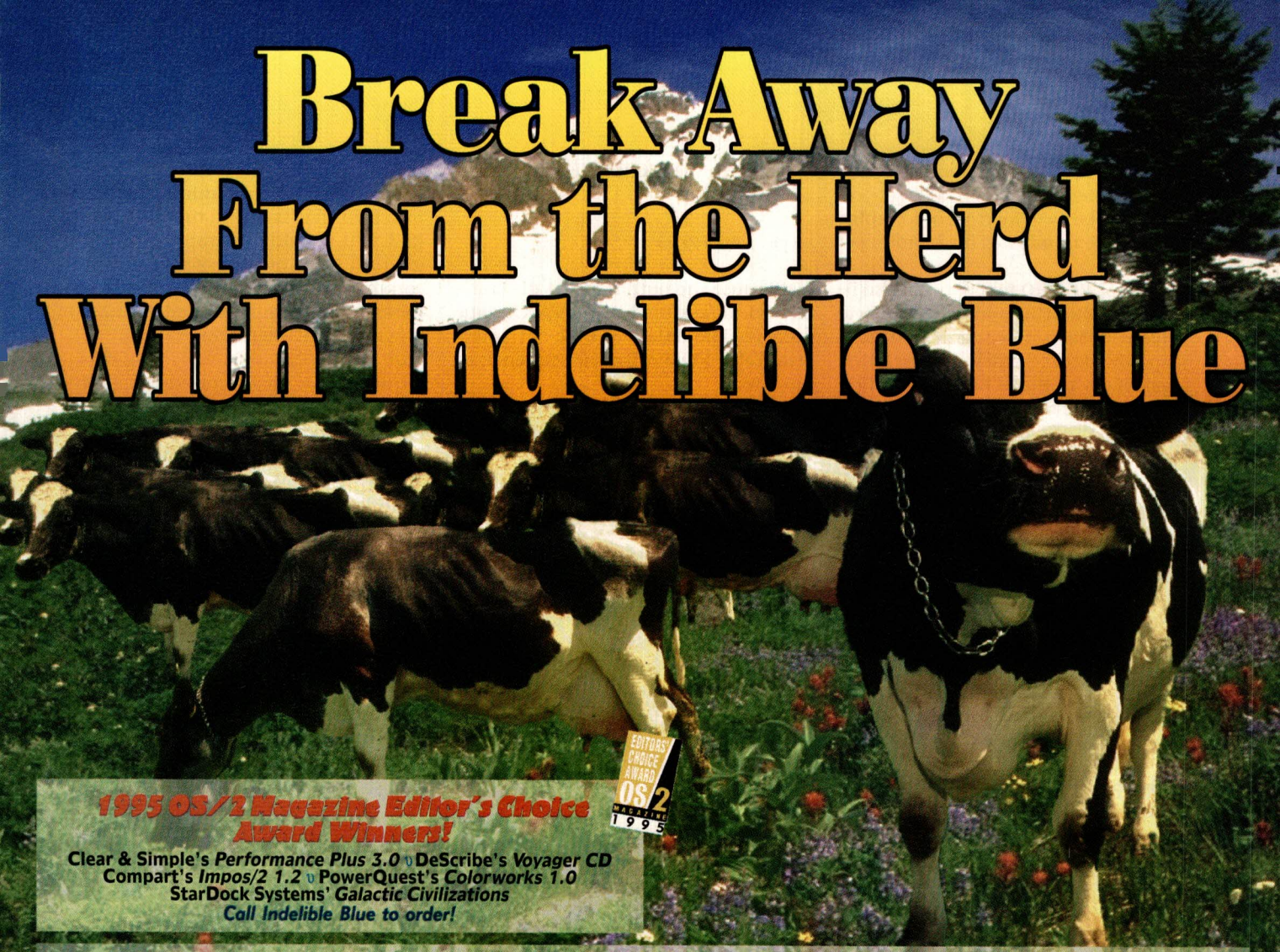

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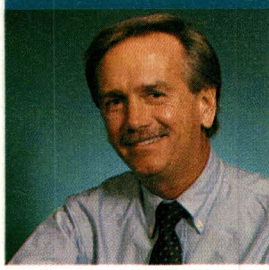

A Quick Fix on FixPaks

IS YOUR COPY OF OS/2 WARP ACTUALLY UP TO DATE?

BY DICK CONKLIN

You've discovered a bug in OS/2 Warp. You checked the OS/2 Support section of your favorite on-line service and found a description of your problem. So, where's the ServicePak to fix it?

Introducing FixPaks

With OS/2 Warp, ServicePaks have been replaced by FixPaks. Unlike ServicePaks, FixPaks only replace a subset of your system—and only if it is needed. In addition, the procedure for installing them has changed. Even if all is well with your system, it's a good idea to know where to find support and how to apply a FixPak—just in case.

Where to find FixPaks

IBM maintains forums and libraries for the support of OS/2 Warp in several official places. You can browse a database of known bugs, discuss your problem with experts, and download FixPak files to your system. See Table 1 for a listing of OS/2 support service locations.

Table 1: OS/2 support service locations.

CompuServe	OS/2 Support Forum (GO OS2SUPP; File Library; IBM Files)
Prodigy	OS/2 Club (Jump: OS/2; Download Library; Browse Files from IBM; IBM Files; Fixes)
America Online	OS/2 Forum (Keyword: OS2; Software Libraries; Patches/Fixes)
IBM PC Company BBS	Call (919) 517-0001; Search for Files (F); Search string "FixPak"; Download (D)
OS/2 Shareware BBS	Call 703-385-4325; File Areas (F); Locate (L); Search string "FixPak"

APARs

If you find problems with OS/2, don't expect IBM to call them bugs. The official name is APAR, which stands for Authorized Program Analysis Report. Problems are reported to IBM through the four on-line services, e-mail messages, fax, or U.S. mail. Each known APAR is verified, a code fix is determined, and the customer is notified—at least in theory (sometimes, the process breaks down and APARs are lost).

Depending on its severity, an APAR is classified in one of four levels. The most serious defects are those that impede the use of OS/2, which, in IBM's words, are classified by the following criteria:

- Data corruption
- Regression of supported function, major application, or device driver compatibility
- Frequent trap or system hang
- Serious visual problem
- Significant portion of hardware or software environment is non-functional

These APARs call for a "fix-in-current" solution; they are problems that can't wait for the next release of OS/2 Warp. They are fixed in the current release with a FixPak, a software patch that you can download and apply yourself. If your problem is described by a known APAR and that APAR is listed for a particular FixPak, it should solve your problem. FixPaks are made available on a frequent and regular basis and are often combined with preventive maintenance updates. Each FixPak for a release of OS/2 Warp (or OS/2 Warp Connect, OS/2 2.1, OS/2 LAN Server, LAN Distance Connection or LAN Distance Remote) is cumulative; it fixes all previously listed APARs for that release.

Other defects are classified as "deferred" and will be fixed in a future product point release. Some are temporarily corrected by workarounds. Lists of current APARs are maintained in *.inf* files that are easy to browse or search with keywords. I downloaded *30apr1.zip*, unzipped it, and found *30apr1.inf*, a database of OS/2 Warp APARs.

If you are encountering a problem that is described by an APAR and is listed as fixed by the most recent FixPak for your version of OS/2 Warp, you can proceed to the next step.

Before you fix

You should know the current customer service disk (CSD) level of your system. At an OS/2 prompt, enter the command

SYSLEVEL. If OS/2 Warp is installed, you should see a report, a portion of which is shown in Fragment 1.

Xr03000 is the original OS/2 Warp for Windows version and *xr03001* is the OS/2 Warp full-pack release. CSD levels are also shown for OS/2 components, for example, the System Object Model (SOM), OS/2's graphics support, and installed BonusPak applications, such as the IBM Internet Connection for OS/2.

Fragment 1: Report from the SYSLEVEL command.

```
C:\OS2\INSTALL\SYSLEVEL.OS2
IBM OS/2 Base Operating System
Version 3.00     Component ID 562274700
Type 0
Current CSD level: XR03001
Prior   CSD level: XR03001
```

Fragment 2: FixPak file entries.

```
Archiving for x:\WINDOWS\SYSTEM\USERS.SCR.
Updating x:\WINDOWS\SYSTEM\USERS.SCR
```

Next, you'll need some tools

You'll need some new tools before you can apply your first FixPak. The first one you'll need is a utility called *loaddskf.exe*, which is used to create 1.44MB disks from downloaded disk image files. If you installed OS/2 Warp from a CD-ROM, you'll find it in your *c:\dskimage* directory or you can download it from one of the on-line services as *loaddf.zip* (a zipped file) or *ldf.com* (a self-extracting file).

Next, you'll use *loaddskf.exe* to create two "kicker" or Customer Service Facility (CSF) installation disks, which are used to install all FixPaks. I downloaded a file called *wkickr.zip*. When I unzipped it, I found the two disk image files, *csfboot.1dk* and *csfboot.2dk*, and a *readme* file that was needed to proceed to the next step:

Those two disk image files (you can tell by the *dk* in their file-name extensions) are now used to create the two CSF installation disks. You don't have to format the disks first, because *loaddskf.exe* does that for you. The commands you'll need to enter are:

```
LOADDSKF CSFBOOT.1DK A: /F
LOADDSKF CSFBOOT.2DK A: /F
```

Getting started

Now that you have the necessary tools, you can move on to installing an OS/2 Warp FixPack (WFP). I downloaded *wfp_05.zip*. It contained a couple of *readme* files and three disk images. Again, *loaddskf.exe* was used to transfer their contents to three disks using the following commands:

```
LOADDSKF XR0W005.1DK A: /F
LOADDSKF XR0W005.2DK A: /F
LOADDSKF XR0W005.3DK A: /F
```

Be sure to read the *readme* files that are created when you unzip the FixPak file and any that you find on the first CSF disk. They will explain the rest of the installation process, which will vary depending on your system and the nature of the FixPak. They will also explain any disk storage (temporary or permanent) that is required. The *readme* files will also describe the contents of the *service.log* in the *\os2\install* directory. Each FixPak file should have two entries. The entries should appear as shown in Fragment 2.

Installing the FixPak

You have two CSF disks and one or more FixPak disks. Insert the first CSF Boot Disk (*csfboot.1dk*) into drive *a:*. Open an OS/2 window and enter the following command:

```
A:\SERVICE
```

(Note: Do not boot from the CSF Boot Disk unless you are instructed to.)

Follow the instructions that are given. When you are prompted to insert Corrective Service Disk 1 (the first FixPak disk, which is, in my case, labelled *xr0w005.1dk*), insert it into drive *a:*. Repeat this procedure for disk 2 and disk 3 when prompted.

What if nothing happens?

If you see a message that says: "No Files to Service" while applying the FixPak, it means that the current CSD level of your OS/2 installation doesn't match the FixPak that you are attempting to install. In other words, you either don't need the FixPak or this FixPak is not the right one for your system.

Archives and backups

If this OS/2 Warp FixPak is the first you have applied to your system, you'll be asked for the name of a directory where copies of replaced files will be stored, such as *c:\archive*. If it is not your first OS/2 Warp FixPak, name a backup directory where copies of replaced files can be stored, for example, *c:\backup*. In either case, make sure that sufficient space is available. Even though these files are kept in a compressed format, they might require several megabytes of disk space.

When a FixPak installation can't be completed

During installation, you might receive a message that says "deferring service," which means that a file to be updated is currently in use by the system and cannot be replaced. The new files from the FixPak are placed in the *\os2\install\ibmcsflk\fix* directory on your OS/2 Warp boot drive in unpacked format for use by the locked file device driver the next time you boot OS/2. When you shutdown and reboot, you should see the following messages:

```
The locked file driver is loaded.
Processing locked files
Processing complete
At this point the system may do
an automatic reboot.
```

Playing it safe

CSF lets you apply fixes to a single system or to multiple systems in a LAN environment and prevents you from applying a FixPak that is inappropriate for your system. CSF verifies that the country code, version, release level, and current CSD level of the product are compatible with the service updates and will not proceed if a mismatch occurs. Information about the level of the products on a system is contained in the *syslevel.xxx* file in the *\os2* directory on the boot drive.

Depending on the product, CSF might save a copy of your product files before applying a FixPak. This copy of your base-level (installed or committed) files is called an archive. It can be used to restore a product to its base level at any time. In general, an archive is

required by products that take considerable time and multiple disks to install and not required by products that can be reinstalled easily with few disks.

Occasionally, even a FixPak that is compatible with a product can cause problems. CSF lets you remove or back out of a FixPak to return a product to its previous level without having to reinstall. CSF lets you restore in either of two ways. Remove all fixes that were applied since the product was installed or last committed, restoring it to its base level. Or, you can remove the most recent service package, which restores the product to its previous fix level.

Once you have tested the fix, you can "commit" it, freeing temporary disk space used by CSF. After a fix is committed, you cannot restore the product to an earlier fix level.

New fix support strategy

In September 1994, IBM announced changes to the way it handles reported defects. Standard Fix Support, which I have been describing so far, applies to most OS/2 users. Custom Fix Support is a new service that is intended for customers who require specialized support, such as selected fixes for specific APARS, code fixes on an accelerated basis, or fix testing performed on a specific customer system configuration. This service is available for a fee.

In addition, IBM announced that service for previous releases (such as OS/2 2.1) would be continued for a period of one year following the availability of a new version (such as OS/2 Warp). IBM also announced support for national language versions that are not covered by local country support, which can be obtained for a fee.

For more information on IBM's OS/2 support offerings, call: Standard Fix Support in the U.S. at (800) 992-4777; select option 1, then 2. In Canada, call (800) 465-9600. For support in other countries, contact a local IBM office. For Custom Fix Support in the U.S., call (800) 799-7765. In Canada, call (800) 465-9600.

Dick Conklin is a contributing editor to OS/2 Magazine and author of three OS/2 books. He can be reached at CompuServe 76711,1005 or Internet os2mag@vnet.ibm.com.

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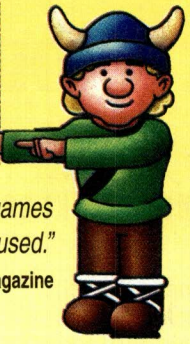

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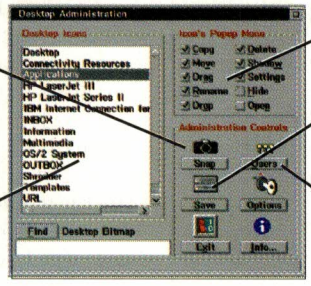

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Reader Service No. 29

Fixing Extended Attributes Problems

WHAT THE SILLY THINGS ARE, WHY THEY BREAK, AND HOW TO KEEP THEM FROM BREAKING. BY MARK MINASI

Last month, I explained CHKDSK error messages that refer to allocation errors, lost clusters, and cross-linked clusters. However, CHKDSK also has a way of complaining about lost and cross-linked extended attributes. This month, we'll take a look at those attribute problems, examining what they are and how they happen.

Ever since DOS 2.0, PC operating systems have incorporated the idea of file attributes—simple one-bit flags that contain information about a file. One of those attributes is known as archive. It indicates if a file has been backed up, whether it is read-only or hidden, system (which means that you shouldn't move it), directory (which means that it's not a file, it's a subdirectory), and label (which also means that it's not a file—in this case, it's a volume label for a disk). But, because that set of options is fairly limited, it would be quite useful to be able to "roll your own" attributes. For example, it would be nice to be able to attach an owner to a file or associate a file with a project or an application. That's where extended attributes come in.

In November 1989, Microsoft released OS/2 1.2. It was the first version of OS/2 that allowed you to define an attribute for a file, although OS/2 didn't actually use extended attributes in version 1.2 or 1.3. It was not until OS/2 2.0 that they really found a home—in the Workplace Shell. When you change an object's color or its icon or, for that matter, just about anything in its Settings Notebook, that information gets stored in its extended attributes. You can see the number of bytes in an object's extended attributes by looking at the File tab of the Settings Notebook or by using the /n option on the **dir** command.

Because the given set of file attributes is fairly limited, it is quite useful to be able to "roll your own."

Extended attributes appeared with HPFS, which has plenty of space to accommodate them. But how would we graft extended attributes onto a FAT-based disk? Where do we put them? Well, not in the file—that's for sure. The applications that work with the file wouldn't know what to do with extra meaningless bytes, for example, if you attached an icon to an ASCII text file. The file is manipulated by a text editor, which wouldn't be able to handle an ASCII file with binary information appended to it. So, the extended attributes must be placed somewhere else. They are placed into clusters on the hard disk—just like any other data.

Unfortunately, this arrangement is very inefficient, as disk clusters can range from 2,048 to 32,768 bytes. A file with 20 bytes of extended attributes might burn up anywhere from 2K to 32K just to store that small amount of data, but the FAT file system has no other easy way to store them. Furthermore, each cluster that holds an extended attribute can only hold the extended attributes of one file. Extended attribute clusters cannot be shared between files.

Because many files exist on a disk, many clusters will exist that hold extended attributes. Once the clusters are allocated, however, the work's not over. If you read last month's column (September 1995, p. 59), or, if you're familiar with the structure of the FAT file system, you know that you can't simply put data in a cluster and leave it there. The File Allocation Table must be informed that data has been placed in that cluster. Otherwise, the FAT will think that the cluster is available and overwrite its data. That's why the cluster must be part of a file and must be allocated.

But, allocated to what? Which file should contain these clusters? Well, no file existed, so Microsoft created one to hold the extended attributes. They called it *ea data. sf*. The spaces make it an odd name to discourage idle disk-cleaners from wiping the file off the disk, taking all extended attributes with it. It's a catch-all name for the scattered clusters that hold extended attributes for files on the disk. The file resides on the disk's root directory and it's hidden to further discourage overzealous disk cleaners.

The extended attributes are located

in clusters by themselves and those clusters are lumped under the generic file name, *ea data. sf*. But, how does a file know whether or not it has extended attributes, and, if it does have them, how does it know which one belongs to the file? Since the days of CP/M, directory entries have been 32 bytes long. Under CP/M, 10 of those bytes were used to locate a file, doing a simplified version of what the FAT does today. So that it would work as much like CP/M as possible, the early designers of DOS left those 10 bytes in the DOS directory entries, but left them unused. DOS and OS/2 directory entries on FAT volumes are, therefore, 32 bytes long, but with 10 unused bytes. Two of those bytes are used by OS/2 as a pointer to extended attributes (let's call them PEAs for short).

Windows NT and Windows 95 make use of that unused area of a disk directory on FAT volumes. NT uses it if you install it using the FAT file system—it will support HPFS or NTFS alternatively—and Windows 95 uses the bytes to allow it to support long file names and other extended attribute-like features. The bottom line is that NT has been built to work with OS/2 and Windows 95, so it's safe. But, Windows 95 is only built to work with Windows NT, so putting it on the same logical drive as OS/2 isn't a good idea.

What can go wrong with PEAs? Well, suppose you blast the files in your root directory, including *ea data. sf*. Dozens of files will contain pointers to extended attributes that no longer exist. You'll see a message when OS/2 boots, for example, "XYZ.DAT has attempted to claim an extended attribute that does not exist." It would be best if you could restore the extended attributes, but, if you can do nothing else, you should at least prevent OS/2 from sending these messages by scrubbing the PEA off the file's directory entry.

You can use Symantec's DiskEdit if you're handy with it or you can simply dual-boot back to DOS and let DOS do it. DOS knows that those ten bytes should be unused, so it refuses to copy them when it's copying a file. Copy the file to another filename and copy it back to the original filename. Erase the copy and you will have a file that is the same as the original, except that it has no PEA in its directory entry. Now and then, by the way, I run across disk defraggers that don't preserve PEAs.

Now, suppose you clean OS/2 off your system, using DOS to delete OS/2's directories as well as the files in the root. It seems that all is well and you're ready to install your new version of OS/2. Right? Not quite. Suppose you had 50 files that were part of the OS/2 operating system that had extended attributes and you had 20 files that had extended attributes, but weren't part of OS/2—perhaps an application. You zapped *ea data. sf* and you zapped the 50 OS/2 files that think they have extended attributes. You haven't, however, zapped those 20 other files that claim extended attributes 51 through 70. Now you install a new version of OS/2, or perhaps you re-install the old

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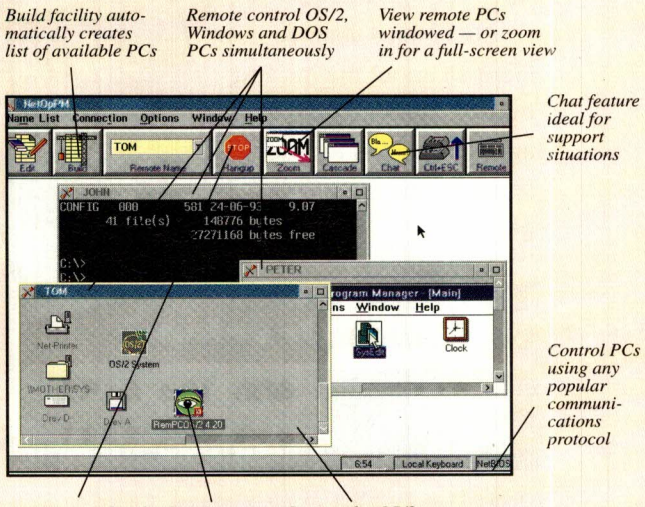
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version, but with more options enabled. The result: a new setup, a new *ea data. sf*, and, in all probability, more files that claim extended attributes. Now you have, say, 60 OS/2 system files that think they own extended attributes 1 through 60 and 20 leftover applications files that think they own extended attributes 51 through 70. The applications that think they own 51 through 60 are sorely mistaken, but they don't know that and they'll claim the extended attributes of some of the OS/2 system files. OS/2 will discover that when it boots, reporting that certain files are "cross-linked on extended attribute X," whatever "X" is.

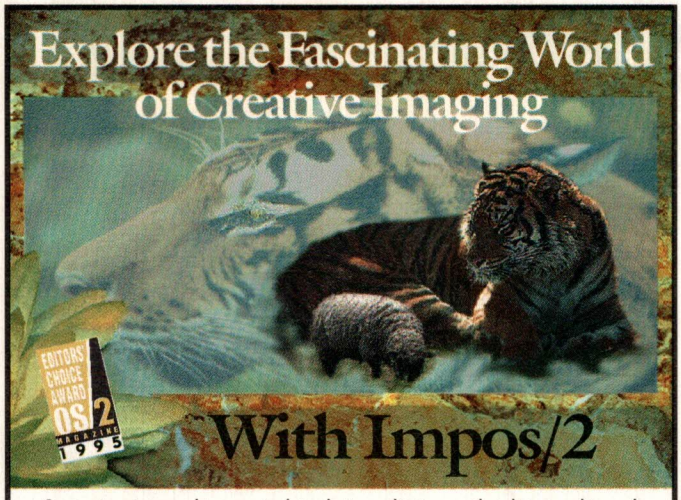
The answer? First, don't blow away *ea data. sf*. Ever. Second, if you're in the position, examine the pairs of files that both claim a given extended attribute. Take the older one and scrub its extended attribute pointer off. Now, by "older," I don't necessarily mean the one with the less recent date; you'll have to do a little detective work. But, usually it's an OS/2 system file that's fighting with an application file. When that's the case, the OS/2 system file is usually the right one, and the application file is the pretender.

What happens if you scrub the PEA from a file while under DOS and reboot under OS/2? This type of thing happens with dual boot, because the *config.sys* file gets moved around under OS/2 and DOS. You then have an extended attribute that no one claims—one that has no PEAs pointing to it. The result is a lost extended attribute. Upon boot, OS/2 (or CHKDSK, if you run it after having booted from the installation disks) will offer to convert the lost extended attribute to a file or delete it altogether. If you think that you know what file it came from, convert the lost extended attribute to a file. You can then re-attach it to its original file with an OS/2 utility called EAUTIL. Simply type **eautil filename eafilename /j** and they'll be re-united.

Grafting extended attributes onto the FAT file system wasn't easy, but OS/2 managed it. This marriage of convenience doesn't usually create problems, but now if it does, you'll be better equipped to handle it.

Grafting extended attributes onto the FAT file system wasn't easy, but OS/2 managed it.

Mark Minasi has been a consultant and educator in the fields of advanced PC operating platforms and PC technology since 1984. He is a contributing editor for Compute, BYTE, and OS/2 Magazine. You can contact him at CompuServe 71571,264 or Internet mark@smtphost.mmco.com.



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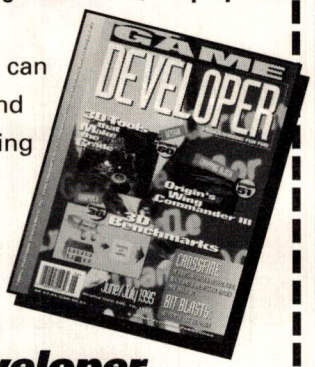

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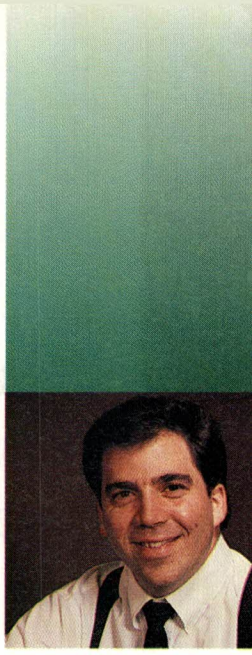
PS/2 and Gateway Problems, SMP development, and CPS: Errors



DO YOU REALLY NEED THAT WINA20.386, AND HOW DOES OS/2 WORK WITH HARD DRIVES THAT ARE BIGGER THAN 528MB? BY DAVID REICH

OUT OF MEMORY

Q: Sometimes, when running many applications, I get an "Out of Memory" error. I thought OS/2 was a virtual memory system, using the disk for swapping when no more physical memory is left. I have a lot of room left on the hard disk where the swapper is. Why am I seeing this message?

A: Your assumption is absolutely correct. OS/2 is a virtual memory system and most definitely uses the disk for swapping (paging) when no more physical memory is left. The message you are seeing is actually a generic "Out of Resources" message. More specifically, some resource, such as bitmap handles, has been exhausted.

As OS/2 has been enhanced, more and more limits are raised or eliminated. For example, OS/2 version 2.0 had a limit of 1,200 window handles. Now that limit is closer to 15,000. It's the same with file handles. More than 64,000 are now available in the system. IBM continues work to expand the limits of OS/2, but just as with any other system, you might happen to hit one of them.

It would be better to see exactly which limit you have reached. This generic error message shows you that you've reached a system limit and tells you that you must either close down one or more applications to accomplish the task you want or, in some cases, you can simply reboot the machine to free up resources if you are not sure which application is eating them.

OS/2 is a virtual memory system and most definitely uses the disk for swapping (paging) when no more physical memory is left.

PS/2 *.bio* FILES

Q: I accidentally deleted my **.bio* files and was not able to recover all of them successfully. I have been receiving several messages from OS/2 on startup, when, I think, OS/2 is processing *config.sys*, stating that it can't find the files. So far, I have not had any problems other than the startup messages. Can you tell me the purpose of these files and how to reinstall them?

A: **.bio* files are only used or required by PS/2 systems, and are additions or patches to the ABIOS (Advanced BIOS) on PS/2s. OS/2 uses the ABIOS on PS/2 microchannel bus machines. The fact that the ABIOS patches or additions are not present might not cause OS/2 to refuse to run, but you might run into problems sometime during execution. You could reinstall OS/2 to get the *.bio* files back, but that would be rather drastic. Because the files have names that are based on the model and submodel byte codes in your system, you probably won't be able to figure out which file to copy. So, to get the file(s) back without reinstalling, follow these instructions.

- Copy all **.bio* files from the Installation Disk to your hard disk. You should put them in the *\os2* directory on the boot drive.
- Look at the *install.log* file in the *\os2\install* directory on the boot drive to see which **.bio* file(s) the OS/2 installation routine placed on the system.
- Create a text file in the *\os2* directory called *abios.sys*. In this file, type the name of the *.bio* files that are needed, one file name per line. Save this file and reboot. You can safely delete the other *.bio* files that were not referenced in *abios.sys*.

As an alternative, and to save you the trouble of finding each specific *.bio*

What does the error message: "CPS:Extent not found" mean and how can I avoid or prevent it?

file you need, simply copy all of the *.bio* files to the *\os2* directory and put all of the file names in *abios.sys*. In fact, you can simply copy the *abios.sys* file from the installation disk. Any unneeded files simply will not get loaded during the boot process.

SYMMETRIC MULTI-PROCESSING

Q: I am contemplating building a dual Pentium processor computer with OS/2 SMP as the operating system. My intent is to develop mathematical scientific multiprocessor functions to accompany some of the major scientific packages. I have found it difficult to get much detailed information about OS/2 SMP. Does SMP automatically allocate a processor to the highest priority waiting thread, or do functions associate a thread or a process to a processor? And, are additional libraries needed to accomplish multiprocessor-related functions other than those included with the standard compilers?

A: OS/2 SMP is only OS/2-enabled for symmetric multiprocessor systems. You don't need to make any changes to your applications. And, assuming that the applications are written properly (SMP-safe, which means that the application does not depend on instructions on different threads being processed in a specific order without the appropriate synchronization in place), the SMP scheduler allocates a processor to the next highest priority thread, unless that thread has previously been preempted. If it has been preempted, it will go back into the same processor it was in before.

The only difference you will see is that the more threads your application has, the better it will perform. Other than that, no difference actually exists between OS/2 for SMP and basic OS/2. If you are a developer, no new libraries are needed, unless you need to use one of the new SMP-specific functions, such as spin-locks. However, unless you are writing a device driver, you don't need to worry about that. As long as you write well-threaded code with SMP-safety in mind, your applications will be OS/2 applications and will run on uniprocessor machines—and even better on SMP machines. No technical specifications actually exist because all of this information is hidden from applications. For application programmers, nothing is needed; the system handles it. For more information, see "Imperfect Symmetry" (October 1995, p. 36).

WINA20.386

Q: A previous version of Windows put the file *wina20.386* on my system. What is this file and does OS/2 need it? If I have 486 and Pentium computers, can I safely delete it?

A: This file was used to allow some Windows versions to access memory above the A20 address line in the computer system. It made memory past the 640K line accessible. OS/2 has its own memory-management system and does not need this extraneous file.

CPS:EXTENT ERRORS

Q: I have heard about and have sometimes seen an error that stops the system and causes the screen to display the message: "CPS:Extent not found," and nothing else. What is this error, what does it mean, and how can I avoid or prevent it?

A: These errors are usually caused by the hardware. The error messages represent file corruption—either on the hard disk, or in memory. Corruption in memory can be caused by hardware accessing the data or address bus at the wrong time or responding to commands not addressed to it, poor busmastering, DMA trouble, and so on. It can also be caused by bad device drivers or anything with access to the memory at ring 0.

It is most definitely more elegant if the system detects these errors and does some real-time diagnosis, stopping the system only in a critical situation. OS/2 Warp fixes some of these situations, but not all of them.

Some of the CPS errors include:

- CPS:Extent not Found.
- CPS:Empty allocation block not supported.
- CPS:Corrupt File "SPARSE ALLOCATION."

These errors cause Internal Processing Errors (IPEs) that stop the system even if the file that's corrupt is trivial. In HPFS, disk allocation for files and directories are described as "extents." If an extent is corrupt, it means that the information is not valid for the file or directory. In the case that the file is not critical to system processing, this should not cause an IPE.

Many of the IPEs that are seen with these errors were user or application files that the system does not need to run. Causing an IPE prevents proper system shutdown, which can compound an existing file system problem. The correct output should read, for example, "file or directory not accessible, CPS: Extent not found." The operating system should then continue processing if the file or directory was not needed for operating system integrity (for example, a users data file or program).

It is important to note that most of these errors actually take place in memory cache of HPFS. When these errors occur in memory, instead of on the hard disk, the cause is almost always hardware-related. I'll list some of the more common causes and solutions.

- Faulty LAN-Streamer cards. Replace the card with a good one.
- EISA systems with Busmaster cards in them. Removing these cards often fixes the problem, as EISA is known to have problems with DMA.
- CPS errors have been seen on Pentium systems with PCI IDE interfaces, which is a problem with the chipset itself, which causes a corrupted read to occur.

In general, you can't do much to avoid the problem other than look at your hardware configuration. If you encounter the error, reboot your system and make sure to CHKDSK the drive to see if the problem occurred in memory on the drive itself. Then, report the problem to the IBM support line, so they can pass the information on to development to have the appropriate error handling enhancement made to OS/2.

DELETING PRINTERS

Q: I installed printer drivers for use with attached or network printers. But, how can they be deleted? I installed several drivers that I no longer need, because the network printers I use have been upgraded. Now, every time I want to select a printer driver, I have a long list of drivers that I don't need. Does a printer driver management tool exist, or does OS/2 provide a way to do it?

A: Deleting a printer driver is even simpler that installing one. You might think that all you need to do is get the context menu for a printer and choose Delete. That will delete the printer object, not the driver.

To delete a printer driver, open up the Settings Notebook for any printer object with a right-click on the printer object. With a left-click, select Settings. Now, use the left button to select the Printer Driver tab. In the printer driver window (the upper one—the lower one is the Default driver window), use right-click to bring up the context menu of the printer driver that you want to delete. Now, left-click on the Delete item in the context menu. That's all you have to do. Close the printer object and you're done. You can delete any printer drivers this way. Just make sure not to delete the active ones or any default drivers for other printer objects.

528MB LIMIT

Q: I've heard so much about OS/2 not being able to access drives that are larger than 528MB. Yet, I know people who have 1GB drives and others who have drives well over 528MB. How do you explain it?

A: I turned to the disk guru, Doug Azzarito, to explain the full story of drive limits. The limit does not exist for SCSI drives. The limit only exists on IDE (the disk interface specification) drives. The limits depend on the system. Under normal circumstances, the system BIOS limits you to 1,024 cylinders and 63 sectors per track. Since IDE can't contain more than 16 heads, the combined limit is 528MB.

This combined limit requires that all bootable partitions (including Boot Manager) be completely within this range (because OS/2 depends on BIOS to boot). Once the system is booted, OS/2 loads the ST506 disk device driver. It does not use BIOS, so OS/2 can throw out the 1,024 cylinder limit (IDE drives can contain up to 64,000 cylinders). You can create data partitions using the space beyond cylinder 1,024, as long as you are under control of the ST506 driver.

Some IBM systems use sector translation to avoid this problem. They ignore the IDE 16-head limit and use the BIOS limit of 255 heads, which allows a BIOS limit of 1024 x 255 x 63, or 8GB. All incoming BIOS addresses are translated into an IDE geometry before being presented to the drive. This process makes the entire IDE drive bootable. OnTrack's Disk Manager software is another method that is being used. It replaces the BIOS function to break the limit.

Deleting a printer driver is even simpler that installing one.

A similar function has since been built into OS/2 to allow the use of OnTrack's technology.

The Final solution is Enhanced IDE. This method of addressing BIOS is completely new. IBM machines have Enhanced IDE BIOS, as do some other manufacturers' systems. The problem with EIDE is that system software must be updated to detect and use it.

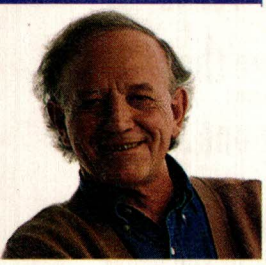
The issue is fairly complicated. If you find that you cannot use the drive the way you want with the latest version of OS/2, you should be sure that you set up your system with the bootable partition within the first 528MB and use the rest for programs and data.

GATEWAY INSTALL HANG

Q: I purchased a Gateway computer and started installing OS/2 Warp on it. During installation, the computer spins on disk 1 and hangs. How can I install OS/2 Warp?

A: On some Gateway systems, you might experience this hang. It usually points to an old BIOS. Check your BIOS level when the system boots up. If you have the Gateway 1.00.03.AF1 BIOS, you need to update your BIOS (see your system documentation). A fix is available from Gateway.

David Reich, a contributing editor to OS/2 Magazine and author of Designing High-Performance OS/2 Warp Applications, has been with the OS/2 development team since 1987. David is interested in your questions and suggestions. Contact him at CompuServe 76711,632 or Internet speedracer@bocaraton.ibm.com.



Silver Threads Among the Gold

DESIGNING HIGH-POWERED OS/2 WARP APPLICATIONS

BY STAN KELLY-BOOTLE

We've been told many times, but let's run the tape again. The operating system wars will be won by the side that musters the best set of applications as perceived by the paying user. It's those implacable market forces that brought down the Berlin Wall and burnt the topless bars of Ilium. Yes, the Trojan affair was but a sordid trade-war and Helen's plumage don't enter into it. Likewise, until the technological superiority of OS/2 is translated into fast-moving Egghead inventory, the Dark Microsoft Empire will prevail. IBM is making commendable progress in promoting OS/2, the key to which is winning the hearts, souls, and coding efforts of software developers. The latter, on the whole, recognize the merits of OS/2, but (don't we all) need to allocate their resources for maximum returns. You can readily discern a Catch-22 situation: the installed OS market base that encourages the production and porting of applications is itself determined by the availability of applications.

To better understand this complex equation, I've been reading David Reich's latest book, *Designing High-Powered OS/2 Warp Applications* from John Wiley & Sons. As a development manager with IBM's OS/2 team and contributing editor for *OS/2 Developer*, David's technical know-how and insider's authority are clearly established. David, of course, is also my neighboring Tips & Tricks *OS/2 Magazine* columnist and I must confess that this accidental contiguity does color my judgement. Because our columns appear on adjacent pages, readers occasionally misdirect their OS/2 queries to poor, oft-stumped me. The resulting forwarding and exchange of e-mail leaves me in awe of David's knowledge and industry.

Designing High-Powered OS/2 Warp Applications is aimed unabashedly at software developers who are pondering the pros and cons of OS/2 as a target platform in a Windows-dominated market. As the title indicates, the book focuses on OS/2 applications design, instead of the nuts and bolts of programming. The book has hardly a line of code in sight, perhaps encouraging a wider audience among those non-programming semi-technical managers who have to make OS-related decisions.

The opening chapter extols OS/2 from the user's angle, explaining the advantages of the Workplace Shell, the consistent object-oriented user interface (OOUI), the multithreaded road to high-performance, the 32-bit flat memory model, paged virtual memory, and device independence. These bounties are familiar to the OS/2 community, but the message must be hammered out tirelessly. Less familiar is the author's discussion of the future advantages: SMP and PowerPC compatibility.

Chapter 2 poses and answers the question "Why Program for OS/2?" Here, the author stresses the powerful, flexible API and the rich set of cross-development tools, including IBM's language-independent System Object Model (SOM) and the ever-nearer platform-independent OpenDoc.

Chapter 3 moves on to OS/2 as a development platform. Yes, programmers love and need multitasking even more than mere users. With OS/2, they can edit, compile, link, debug, and recompile in separate, simultaneous sessions and still slurp their won tons with the other hand.

The rest of the book progressively digs deeper into the OS/2 architecture and its coding implications, starting with some general considerations that are valid for all programming projects. Reich preaches the 60/30/10 rule (60% design, 30% code, 10% test) and reveals the joys of modular maintainability. Perhaps of greatest importance is the detailed discussion of the OS/2 process/thread model. Writing code to fully exploit multithreading is far from trivial. This book will ease the pain. I suspect that in a few years time, we'll look back at 1995 as the big turning point in OS/2 fortunes. IBM bought Lotus and David Reich published *Designing High-Powered OS/2 Warp Applications*.

I must however close on a sad note. Dr Rudolph Langer, Sybex VP and beloved friend, died on June 22nd after a brave all-too-brief struggle against leukemia. The computer-book world will miss this uniquely gifted pioneer.

RESOURCE:

Designing High-Powered OS/2 Warp Applications—The Anatomy of Multithreaded Programs ($34.95)
by David E. Reich
John Wiley & Sons Inc.
ISBN: 0-471-11586-X
(800) 225-5945
READER SERVICE NO. 178

Stan Kelly-Bootle started computing on EDSAC I at Cambridge more than 40 years ago and has written at least 11 books. His "Devil's Advocate" column in UNIX Review has been running since 1984. His latest book is The Computer Contradictionary (MIT Press, 1995). He welcomes e-mail via CompuServe 70323,1560, Internet skb@crl.com, or S.KBOOTLE on AppleLink.

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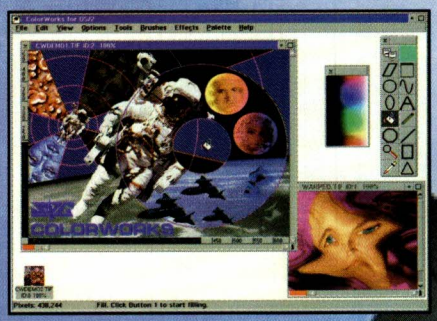

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